

DUST COURIER

Number 12
February 1997

Compiled and
issued by:

Curator/Cosmic Dust
Code SN2
NASA Johnson
Space Center
Houston, Texas
77058 USA
(281) 483-5128

zolensky@
ems.jsc.nasa.gov



News concerning
NASA's collection,
curation and
allocation of
interplanetary
dust, returned
spacecraft
hardware, and
stratospheric dust.

In This Issue

Interplanetary and Stratospheric Dust

Cosmic Dust Catalog 15	2
Unusual Bolide Activity on October 3	2
Cluster-Particle Relationships	2
Guidelines for Preparing a Request for Interplanetary Dust	3
Investigators Who Have Received Dust Samples to Date	4
Status of Stratospheric Collection Surfaces	8
Renumbered Chondritic Interplanetary Dust Particles	14
List of Available Interplanetary Dust Samples	15

Space Hardware: LDEF, Solar Maximum, EURECA, Mir

Available Solar Maximum Samples	19
Available EURECA Satellite Sample	19
Availability of the Trek Blanket	
Flown on the Mir Space Station	20
Impact Features Located on the Trek Blanket	20
Space Hardware Sample Curation and Sample Availability ...	22
Reports and Information Available from the Curator	23
Guidelines for Preparing a Request for LDEF Samples	24
Investigators Who Have Received Returned	
Space Hardware Samples to Date	26
List of Available LDEF Samples	28

Cosmic Dust Catalog 15

Cosmic Dust Catalog 15 is now being published in parallel with this newsletter. This catalog summarizes preliminary observations on 468 particles retrieved from collection surfaces L2021 and L2036. These surfaces were flat plate Large Area Collectors (with a 300 cm^2 surface area each) which was coated with silicone oil (dimethyl siloxane) and then flown aboard a NASA ER-2 aircraft during a series of flights that were made during January and February of 1994 (L2021) and June 7 through July 5 of 1994 (L2036). Collector L2021 was flown across the entire southern margin of the US (California to Florida), and collector L2036 was flown from California to Wallops Island, VA and on to New England. These collectors were installed in a specially constructed wing pylon which ensured that the necessary level of cleanliness was maintained between periods of active sampling. During successive periods of high altitude (20 km) cruise, the collectors were exposed in the stratosphere by barometric controls and then retracted into sealed storage containers prior to descent. In this manner, a total of 35.8 hours of stratospheric exposure was accumulated for collector L2021, and 26 hours for collector L2036.

If you are not currently on the mailing list for the Cosmic Dust Catalogs and wish to be please contact the Curator.

Unusual Bolide Activity on October 3rd

There were numerous reports of unusual meteor events over Texas and California on October 3, 1996. Mr. Frederic Volz, an experienced observer of the stratosphere, also reported unusual haze streamers above cirrus level, possibly in the stratosphere, near Boston on the same day. As it happens, we were flying large area (LAC) cosmic dust collectors in the western US at that time. Thus, we removed the four LAC plates for an optical inspection. The collectors appeared to have only the normal load of particles, although we have not removed any particles for more detailed analysis. Since these four collectors had only sampled for 23.5 hours (from Sept. 26 through Oct 11, 1996), and we like to fly them for at least twice that period, we sent three LAC plates back to the plane for additional collecting. However, we have retained one LAC collector without any further flights in the event that some investigator would like to look for possible particles from the bolide activity of October 3. This plate is L2042. Ask for it by name.

Cluster Particle Relationships

Collector L2001

CLUSTER	PARTICLES
*B	*B1,*B2,*B3,*B4
*C	*C1,*C2,*C3
*D	*D1,*D2,*D3
*E	*E1,*E2, *E4
*F	*F1
*G	*G1,*G2,*G3,*G4
*I	*I1,*I2
*J	*J1
*K	*K1

Collector L2002

CLUSTER	PARTICLES
*A	*A1
*C	*C1,*C2,*C3,*C4,*C5

Collector L2003

CLUSTER	PARTICLES
*D	*D1,*D2
*E	*E1,*E2,*E3

Collector L2004

CLUSTER	PARTICLES
*C	*C1,*C2,*C3
*D	*D1,*D2,*D3

Collector L2005

CLUSTER	PARTICLES
1	A1
4	A4
5	A5,A7,A8
6	A6
7	B7
8	S8
9	B9
10	B10,B19,B20
11	B11,B21,B22, B23
12	B12,B13,B14,B15,B16,B17,B18
13	C1,C13,C25,C26,C31,C34,C38
14	C2,C3,C14,C29,C30,C33,C36
15	C4,C15,C27,C28,C32,C35,C39, C41
16	C16
17	6, 7,C17,C19,C20,C21,
18	C5,C18,C22,C23,C24,C37,C40. C42
19	8, 9,D1,D19,D25,D26.D27.D35, D36
20	D2,D3,D20,D28,D29,D31
21	D21
24	14, 15, 16, 17, 18, D24. D30, D32, D33, D34
25	E1,E2,E3,E25,E31.E32.E36. E42
26	10, 11, E4, E5, E26, E33. E37. E38, E40, E43
28	12, 13,E28,E34,E35,E39.E41
30	E30
31	19, 20, 21, 22, 23, F1. F2, F3. F31. F37, F38.
	F39, F40,*A1,*A2,*A3,*A4
32	F32
33	F4,F33
34	F34
36	F36
38	G1,G38,G43
42	G2,G3,G42
43	H43, H51
44	H1,H44
45	H45,H49,H50
46	H46
48	H48

Guidelines for Preparing a Sample Request

All sample requests should be made in writing to:

Curator/Cosmic Dust
Code SN2
Planetary Science Branch
NASA/Johnson Space Center
Houston, Texas 77058 USA

Information may be obtained by telephone via (281) 483-5128.

Each request should refer to specific samples by their official identification numbers and should contain enough information to permit evaluation of the proposed study and the adequacy of the requestor's facilities. All necessary information should probably be condensable into a one- or two-page letter, although informative attachments (e.g., copies of pages from related proposals, reprints of publications, flow diagrams for analyses) are welcome. In addition, a brief statement regarding the desired method of mounting or containerizing the samples for shipment to the requestor should be included (see article on "Sample Containers for Shipment of Allocated Dust Particles" on pages 14-21 of Cosmic Dust Courier No. 4). Each sample request will be reviewed by the Cosmic Dust Committee (CDC), and CAPTEM, committees of scientists that advise NASA on matters related to the curation and allocation of extraterrestrial samples. The Curator will arrange for all required CDC and LAPST

reviews and will inform investigators of results as rapidly as possible. Prospective sample requestors may select samples from among those described in any issue of the Cosmic Dust Catalog or Cosmic Dust Courier series. However, reference should be made to the sample availability table of this newsletter to check the status of each sample before it is requested. In addition, we encourage investigators to contact us in advance of submitting their sample requests if further information is desired.

Investigators Who Have Received Samples to Date

- Joe Bennett
National Institute of Standards and Technology
Gaithsburg, MD USA
- D. Blake
NASA/Ames Research Center
Mail Stop 239-4
Moffett Field, CA 94035
- G. Blanford
University of Houston
Houston, TX USA
- Janet Borg
Institut d' Astrophysique Spatiale
Orsay, France
- J. Bradley
McCrone & Associates
Westmont, IL USA
- D. E. Brownlee
University of Washington
Seattle, WA USA

Collector L2006

CLUSTER	PARTICLES
1	A1,A2
2	A3,A4,A19,A24,A26,A27,A29
3	A5, A6, A7, A8, A9, A10, A20, A25, A30
4	3, 4, 5, 14, 15, 16, A11, A12, A13, A21, A28, A31, A33, *A1, *A2
5	A14
6	A15,A16,A22,A32, *A3, *A4
7	A17
8	A18,A23
9	B1,B2,B3,B4, *A5, *A6
10	B5,B6,B7,B22, *A7, *A8
11	12,B8,B9,B10,B11,B19
12	B12,B13
13	B14
14	6, 7, 8, 9, 10, 11, 13, 17, 18, 19, B15, B16, B17, B18, B20, B21, B23, *A9, *A10

Collector L2008

CLUSTER	PARTICLES
1	A1
2	A2,A3
3	A4,A5
4	A6,A7, *B1, *B2
5	1,A8,A9, *A1
6	B1
7	B2
8	B3,B4
9	B5
10	B6
11	C1,C2
12	C3,C4
13	C5,C6
14	C7
15	C8,C9,C10
16	D1,D2
17	D3,D4,D5
18	D6,D7,D8
19	D9
20	D10,D11
21	V38
22	V39,V40,V41,V42,V43,V44

Collector L2009

CLUSTER	PARTICLES
1	A1, A9
2	A2, A10
3	A3, A11, *A1, *D1, *D2
4	A4, A12, *A2, *D3, *D4

5	A5,A6
6	A7, *A3
7	A8, *A4,*D5,*D6,*E1,*E2,*E3
8	B1, *D7, *D8
9	B2
10	B3, *A5, *D9,*D10,*E4,*E5,*E6
11	B4, *A6
12	B5,B8,B9, *A7
13	B6, *C1,*D11,*D12,*F1,*F2,*F3
14	B7, *A8

Collector L2011

CLUSTER	PARTICLES
1	A1
2	A2
3	A3,A5,A7,A8,U1
4	A4,A6,A9, A10,V1
5	1, 2, 3, 4, 5, 6, 7,B1,B5, B12, B13, B14, B15,B16,W1
6	B2,B6,B10,X1, *A1, *A2
7	B3,B7,B11, *A3, *A4, *B1, *B2, *B3
8	8, 9, 10,B4,B8,B9,B17
9	C1,C2
10	C3,C4
11	C5,C6,C8, C9, C10, C11, C12, C13, *A5,*A6,*B4,*B5,*B6
12	C7
13	D1,D2
14	D3,D4
15	D5,D7,D9,D10,*A7,*A8
16	D6,D8,D11
17	E1,E2,E8, E9
18	E3,E4
19	E5
20	E6,E7
21	11, 12,F1,F4,F6
22	F2,F5, F7, *A9, *A10
23	F3

Collector L2021

CLUSTER	PARTICLES
1	A1
2	A2
3	A3,A4
4	A5
5	A6
6	A7

- F. Radicati di Brozolo
Charles Evans and Associates
301 Chesapeake Dr.
Redwood City, CA 94063
- T. Bunch
NASA/Ames Research Center
Moffett Field, CA USA
- P.R. Buseck
Arizona State University
Tempe, AZ USA
- J. Darius
London Science Museum
UK
- T. Esat
Australian National University
Canberra, Australia
- C.Y. Fan
University of Arizona
Tucson, AZ USA
- G. Flynn
SUNY
Plattsburgh, NY USA
- John Gavrilovic
McCrone Associates, Inc.
Westmont, IL USA
- E.K. Gibson, Jr.
NASA/Johnson Space Center
Houston, TX USA
- J.N. Goswami
Physical Research Laboratory
Navrangpura, Ahmedabad,
India
- R.H. Hewins
Rutgers University
New Brunswick, NJ USA
- E. Jessberger
Max-Planck-Institute
Heidelberg, FRG
- I. Kapisinsky
Astronomical Institute
Slovak Academy of Sciences
Interplanetary Matter Division
842 28 Bratislava
Czechoslovakia
- L.P. Keller
NRC/Johnson Space Center
Houston, TX USA
- W. Klöck
Westfälische Wilhelms
Universität
Münster, West Germany

- J.C. Laul
Battelle Pacific Northwest Labs
Richland, WA USA
- D. Lindstrom
NASA/JSC
Mail Code SN4
Houston, TX 77058
- I.D.R. Mackinnon
University of Queensland
St. Lucia, Australia
- M. Maurette
Laboratoire Rene Bernas
Orsay, France
- D.S. McKay
NASA/Johnson Space Center
Houston, TX USA
- Scott Messinger
Washington University
St. Louis, MO USA
- A.O. Nier
University of Minnesota
Minneapolis, MN USA
- G.L. Nord, Jr.
U.S. Geological Survey
Reston, VA USA
- K. Ohsumi
National Laboratory for High
Energy Physics
Tsukuba-Shi, Japan
- C. Pillinger
Open University
Buckinghamshire, UK
- F.J. Rietmeijer
University of New Mexico
New Mexico, USA
- L. Schramm
University of Washington
Seattle, WA USA
- Thomas Stephan
Max-Planck-Institut f,r
Kernphysik
Heidelberg, Germany
- S. Sutton
Brookhaven National
Laboratory
Upton, NY USA
- K. Thomas
Lockheed ESC, NASA/JSC
Houston, TX USA
- R.D. Vis
NatuurKundig Laboratorium
Amsterdam, The Netherlands

Collector L2036

CLUSTER	PARTICLES
1	A2, A1
2	A2, A3
3	A4
4	A5, A6
5	O1, O2
6	O3, O4, O5, O6, O7
7	B1, B2
9	B3, B4, B5, B6, B7, B8
13	C1
14	C2, C3
15	C4
16	C5, C6
17	C9
18	C11, C12, C13
19	D1, D2
20	D3, D4, D5
21	D6
22	D7, D8
23	D9, O8 (requires verification, could be due to contamination)
24	D10, O9, O10 (requires verification, could be due to contamination)

Collector U2011

CLUSTER	PARTICLES
*A	C1,*A1,*A2,*A3,*A4
*B	C2,C3,C4,*B1,*B2,*B3

Collector U2015

CLUSTER	PARTICLES
*A	B1, B2, B3, B4, B5, B6, G1, G2,*A1, *A2,*A3,*A4, *A5, *A6, *A7
*B	B9, G3,*B1,*B2,*B3

Collector U2034

CLUSTER	PARTICLES
*A	*A1,*A2,*A3

Collector W7010

CLUSTER	PARTICLES
*A	C3,*A1,*A2,*A3,*A4,*A5, *A6, *A7

Collector W7026

CLUSTER	PARTICLES
*A	*A1.*A2,*A3

Collector W7028

CLUSTER	PARTICLES
*C	*C1,*C2,*C3,*C4

Collector W7029

CLUSTER	PARTICLES
*A	*A1,*A2,*A3,*A4,*A5,*A6, *A7,*A8, *A9,*A10,*A11,*A13,*A14,*A15,*A16, *A17, *A18,*A19, *A20, *A21, *A22, *A23, *A24,*A25, *A26, *A27,*A28, *A29, *A30, *A31 *A32, *A33, *A34
*B	*B1,*B2,*B3,*B4,*B5,*B6, *B7, *B8, *B9, *B10
*C	*C1,*C2,*C3

Collector W7031

CLUSTER	PARTICLES
*A	A1,E1,*A1,*A2,*A3,*A4,*A5
*B	A2,E3,E4,*B1,*B2,*B3,*B4,*B5
*C	A5,E2,*C1,*C2,*C3,*C4
*D	A9,E5,E6,*D1

Collector W7066

CLUSTER	PARTICLES
*A	A1,A5,B1,B2,*A1.*A2, *A3, *A4, *A5, *A6

Collector W7069

CLUSTER	PARTICLES
*A	A1.B2,B3,*A1,*A2,*A3,*A4
*B	A2,B1,*B1,*B2,*B3

Collector W7071

CLUSTER	PARTICLES
*A	A1.A2,B1,*A1,*A2,*A3,*A4

- R.M. Walker
Washington University
St. Louis, MO USA
- Y.L. Xu
Academia Sinica
Nanjing, China
- K. Yamakoshi
University of Tokyo
Japan
- M.E. Zolensky
NASA/Johnson Space Center
Houston, TX USA
- W.H. Zoller
University of Maryland
College Park, MD USA

Status of Cosmic Dust Collection Surfaces

L2001 AT JSC Particles on dimple glass slide (A)/picked
L2002 AT JSC Particles on dimple glass slide (A)/picked
L2003 AT JSC Particles on dimple glass slide (A)/picked
L2004 AT JSC Particles on dimple glass slide (A)/picked
L2005 AT JSC Picked
L2006 AT JSC Picked
L2007 AT JSC Reserved
L2008 AT JSC Picked
L2009 AT JSC Picked
L2010 AT JSC Reserved
L2011 AT JSC Picked
L2012 AT JSC Reserved
L2013 AT JSC Fla.,Miss.,La.,Tex.—Right pylon,Pos.A—10-28/11-20'92
L2014 AT JSC Fla.,Miss.,La.,Tex.—Right pylon,Pos. B—10-28/11-20'92
L2015 AT JSC Fla.,Miss.,La.,Tex.—Left pylon Pos.A—10-28/11-20'92
L2016 AT JSC Fla.,Miss.,La.,Tex—Left pylon,Pos.B—10-28/11-20'92
L2017 AT JSC Hou. to Fla. and south coast/Hou. to Ames and Cal.
L2018 AT JSC Hou. to Fla. and south coast/Hou. to Ames and Cal.
L2019 AT JSC Hou. to Fla. and south coast/Hou. to Ames and Cal.
L2020 AT JSC Hou. to Fla. and south coast/Hou. to Ames and Cal.
L2021 AT JSC 1/7/94 through 2/8/94-out of Ellington/CA,TX,ARK,LA,MISS,CAN
L2022 AT JSC 1/7/94 through 2/8/94-out of Ellington
L2023 AT JSC 1/7/94 through 2/8/94-out of Ellington
L2024 AT JSC 1/7/94 through 2/8/94-out of Ellington
L2025 AT JSC Right wing outside position-TX/CA/WASH/
L2026 AT JSC Right wing inside position-TX/CA/WASH/
L2027 AT JSC Left wing inside position-TX/CA/WASH/
L2028 AT JSC Left wing outside position-TX/CA/WASH/
L2029 AT JSC 4/28-5/24/94 for 26hrs and 46 min./50% of the time over CA
L2030 AT JSC 4/28-5/24/94 for 26hrs.and 26min./50% of the time over CA
L2031 AT JSC 4/28-5/24/94 for 26hrs.and 46 min./50% of the time over CA
L2032 AT JSC 4/28-5/24/94 FOR 26hrs. and 46min./50% of the time over CA
L2033 AT JSC 25°26"-6/7/—7/5/94 WA-CO/CA/WA-VA/New E./// VA-CA
L2034 AT JSC 25°59" 6/7/—7/5/94 WA-CO/CA/WA-VA/New E.///VA-CA
L2035 AT JSC 25°59" 6/7—7/5/94 WA-CO/CA/WA-VA/New E.///VA-CA
L2036 AT JSC 25°59" WA-CO/CA/WA-VA/New E.///VA-CA 6/7—7/5/94
L2037 AT JSC 11/21/95-1/19/96 for 47hrs. 51min./CA,NV,UT/L2037 — 40(set)
L2038 AT JSC 11/21/95-1/19/96 for 47hrs.51min./CA,NV,UT/L2037 — 40(set)
L2039 AT JSC 11/21/95-1/19/96 for 47hrs.51min./CA,NV,UT/L2037 — 40(set)
L2040 AT JSC 11/21/95-1/19/96 for 47hrs. 51min./CA,NV,UT/L2038 — 40(set)
L2041 AT JSC 9/26-10/11/96FOR23°15"**SPEC.DATES//TO BE FLOWN MORE
L2042 AT JSC 9/26-10/11/96 FOR 23°15"**SPEC.DATE/HOLDING THIS ONE OF SET
L2043 AT JSC 9/26-10/11/96 FOR 23°15"**SPEC. DATES//TO BE FLOWN MORE
L2044 AT JSC 9/26-10/11/96FOR 23°15"**SPECIAL DATES//TO BE FLOWN MORE
L2045 AT JSC rMOVED A FLG FROM SET AND INSERTED// TIME AND DATES LATER
U2001 AT JSC Some mounts picked. Lots left of Prime Area 3
U2002 AT JSC Reserved. Very clean flag. No background
U2003 AT JSC Volcanic ash

U2004 AT JSC Volcanic ash/reserved
U2005 AT JSC Ground contamination/in petri dish
U2006 AT JSC Ground contamination/in petri dish
U2007 AT JSC Volcanic ash/in petri dish
U2008 AT JSC Volcanic ash/reserved
U2009 AT JSC Ground contamination. Discarded
U2010 AT JSC Ground contamination. Discarded
U2011 AT JSC Picked
U2012 BROWNLEE,DE TO BROWNLEE
U2013 AT JSC Picked; few particles left. Some aerosol crystallizing at top
U2014 WALKER,RM TO WALKER
U2015 AT JSC Picked; few particles left. Some aerosol crystallizing
U2016 AT JSC Ground contamination and lots of aerosol
U2017 AT JSC Picked. Very few particles left. Light backgr. clear spheres
U2018 AT JSC Picked; some aerosol at the top
U2019 AT JSC Ground contamination
U2020 AT JSC Ground contamination
U2021 AT JSC Ground contamination
U2022 AT JSC Picked
U2023 AT JSC Volcanic aerosol?/reserved; few particles for 40.5 hours
U2024 MCKAY,DS Suspended in freon. Filter pad to McKay
U2025 AT JSC Reserved. Not many particles
U2026 AT JSC Contamination/broken helicoil/reserved; complete aerosol
U2029 AT JSC Aerosol contamination; not many particles
U2033 WALKER,RM TO WALKER
U2034 AT JSC Picked; *A fines left. Maybe 3 more worth picking
U2035 AT JSC Light coverage of ash contamination. Will be hard to pick
U2036 AT JSC Light coverage of ash; few particles. Less ash than U2035
U2037 AT JSC Light coverage of ash; few particles but pickable
U2038 AT JSC Complete coverage of ash; very few particles
U2039 AT JSC Medium background of ash. Only 1 cluster part. worth picking
U2040 AT JSC Aerosol; heavy ash background. Two cluster type particles
U2041 AT JSC Light ash background. No aerosol. Only ash present
U2042 AT JSC Light ash background. No aerosol. A few particles
U2043 AT JSC Light ash background. No particles worth picking
U2044 WALKER,RM TO WALKER
U2045 AT JSC Some aerosol at top. Light ash background. Nothing good
U2046 AT JSC Some aerosol. *No oil left on flag*. Frosted. No particles
U2047 WALKER,RM TO WALKER
U2048 AT JSC Little aerosol or ash. Lots of particles. Good flag to pick
U2049 AT JSC *Some oil miss.*Aerosol/ash background. Med.- heavy particle
U2050 AT JSC Worth inspection:some aerosol/lots of particles. To ground??
U2051 AT JSC *No oil left.* Some aerosol and ash left stuck to the flag
U2052 AT JSC *Some oil missing*. 60-70% aerosol. A few particles
U2053 AT JSC *1/4 of oil missing*. Complete aerosol coverage. Some ash
U2054 AT JSC *Most of oil missing*. Some aerosol. Few particles
U2055 AT JSC *Some oil missing*. Some aerosol. A few particles
U2056 AT JSC Some effects of aerosol. Flag is clean. Possibly 6 particles
U2057 AT JSC FLOWN 10HRS. 3/91-7/91 AND 18HRS.11/92-12/92,"CONTAMINATED"
U2058 AT JSC FLOWN 10HRS. 3/91-7/91 AND 18HRS 11/92-12/92,"CONTAMINATED"
U2059 AT JSC Fla.,Tex.,La.,Miss.—10/28—11/20. Flown in front of U2060

U2060 AT JSC Fla.,Miss.,La.,Tex.—10-28/11-20. Flown behind U2059
U2061 AT JSC Wing tip. Didn't seal or lots of aerosol
U2062 AT JSC Wing tip. Didn't seal or lots of aerosol
U2063 AT JSC Flown on Wing Tip Pod of ER-2
U2064 AT JSC Flown on Wing Tip Pod of ER-2
U2065 AT JSC Wing tip/poss. leakage/meteoritic shower/8/12/93—9/10/93
U2066 AT JSC Wing tip/poss. leakage/meteoritic shower/8/12/93—9/10/93
U2067 AT JSC 9/12-10/13, 40 hrs.—VA,FL,to and from CA - WASH.ID.NV
U2068 AT JSC 9/12-10/13,40HRS.—VA.,FLA.,TO AND FROM CA.—WASH,IDO,NEV.
U2069 AT JSC 9/17/93—12/16/93—40hrs. and 20min. Puerto Rico 1/2 time
U2070 BROWNLEE,DE 9/17/93—12/16/93—40 hrs. 20 min.—1/2 time Puerto Rico
U2071 STEPHAN,T 1/7/94—2/8/94—out of Ellington
U2072 AT JSC 1/7/94—2/8/94—out of Ellington
U2073 BROWNLEE,DE Installed in Hou.—Flown Hou/CA/Wash.
U2074 AT JSC Installed in Hou.—Flown in TX/CA/Wash.
U2075 AT JSC Exposed to ground—delete from system, no data pack
U2076 AT JSC Exposed to ground—delete from system, no data pack.
U2077 AT JSC 6/22/94-1/16/95 for 90.3 hrs./U.S. and Canada
U2078 AT JSC 6/22/94-1/16/95 for 90.3 hrs./U.S. and Canada
U2079 AT JSC Col.#3/Pos.#1,1/21/95 thru 2/4/95. All but 4 hrs. over TX/LA
U2080 AT JSC Col#16/Pos.#2,1/21/95 thru 2/4/95. All but 4 hrs. over TX/LA
U2081 AT JSC Alaska, except for flight home
U2082 AT JSC Alaska, except for flight home
U2083 AT JSC 6/4/95—6/14/95///Alaska
U2084 AT JSC 6/4/95—6/14/95/// Alaska
U2085 AT JSC 11/29/95-1/19/96 for 32hrs. 44min./CA,NV,UT/LAC'S Also
U2086 AT JSC 11/29/96-1/19/96 for 32hrs. 44min./CA,NV,UT/LAC'S also
U2087 AT JSC 45hrs.39min. of flight time//CA,NV,UT,CO,AZ mostly
U2088 AT JSC 4/5/96-6/28/96 for 45'39". Mostly over CA,NV. Last 2 VA.
W7001 AT JSC Ground contamination. Picked. Discarded
W7002 AT JSC Ground contamination;in petri dish. Discarded
W7003 AT JSC Ground contamination;in petri dish. Discarded
W7004 AT JSC Ground contamination;in petri dish. Discarded
W7005 AT JSC Ground contamination;in petri dish. Discarded
W7006 AT JSC Ground contamination;in petri dish. Discarded
W7007 AT JSC Ground contamination;in petri dish. Discarded
W7008 AT JSC Ground contamination;in petri dish. Discarded
W7009 AT JSC Light ash;less aerosol. Lots of particles;good flag to pick
W7010 AT JSC Some mounts picked.A lot left. Light ash. Some aerosol. Good
W7011 AT JSC Reserved. Good flag to pick. Light ash. Lots of particles
W7012 BROWNLEE,DE TO BROWNLEE
W7013 AT JSC Picked 8 mounts. 2 cluster particles remain on flag
W7014 WALKER.RM TO WALKER
W7015 AT JSC Light ash background at top of flag. Good flag. (3/4 mounts)
W7016 AT JSC Reserved. Light background of ash. (2/3 mounts)
W7017 AT JSC Picked 7 mounts. Freon rinsed; filtered; to McKay
W7018 WALKER.RM TO WALKER
W7019 WALKER,RM TO WALKER
W7020 AT JSC Reserved. Light ash background. Good. (3/4 mounts)
W7021 WALKER.RM TO WALKER
W7022 WALKER.RM TO WALKER

W7023 AT JSC Reserved. Light ash at top. Good flag to pick
W7024 WALKER.RM TO WALKER
W7025 AT JSC Reserved. Very light ash backg. Little aerosol. Good(3/4Mts)
W7026 AT JSC Some parts. picked. Ash (8-10um). Lots of dark spheres
W7027 AT JSC Picked/Previously allocated to Brownlee. Light ash,notch
W7028 AT JSC Picked. Good(1/2 mounts). Oil is clear. Some crystallization
W7029 AT JSC Picked 10 mounts. One cluster particle remains on flag
W7030 BROWNLEE,DE TO BROWNLEE
W7031 AT JSC Picked/Previously allocated to Brownlee. Two mounts left
W7032 AT JSC Picked. One mount left. Ash and aerosol at top
W7033 AT JSC Volcanic ash/completely rinsed onto nucleopore filter
W7034 AT JSC Volcanic ash/completely rinsed onto nucleopore filter
W7035 AT JSC Volcanic ash/reserved
W7036 AT JSC Volcanic ash/picked
W7037 ZOLLER,WH Volcanic ash/completely rinsed onto nucleopore filter
W7038 AT JSC volcanic ash/completely rinsed onto nucleopore filter
W7039 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7040 AT JSC Volcanic ash/reserved
W7041 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7042 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7043 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7044 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7045 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7046 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7047 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7048 AT JSC Deployment failed/reserved
W7049 AT JSC Volcanic ash/completely rinsed into freon-113 bottle
W7050 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7051 AT JSC Volcanic ash/reserved
W7052 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7053 AT JSC Volcanic ash/picked
W7054 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7055 AT JSC Volcanic ash/completely rinsed into Freon-113 bottle
W7056 AT JSC Volcanic ash/collector inverted/reserved
W7057 AT JSC Volcanic aerosol/broken flag/reserved
W7058 AT JSC Volcanic aerosol
W7059 AT JSC Volcanic aerosol
W7060 AT JSC Volcanic aerosol
W7061 AT JSC Volcanic aerosol
W7062 AT JSC Volcanic areosol
W7063 AT JSC Volcanic aerosol
W7064 AT JSC Volcanic aerosol
W7065 AT JSC Volcanic aerosol and ash. Hardly any particles
W7066 AT JSC Few particles. Picked light ash/aerosol.crystal. (~2 mounts)
W7067 AT JSC Reserved. Light ash/aerosol.crystal. (~1 mount)
W7068 AT JSC Picked. Ash/aerosol.crystal. Some thinning of oil (~1 mount)
W7069 AT JSC Picked. Light ash/some aerosol. Some oil thinning. (~3mount)
W7070 AT JSC Reserved. Aerosol/ash. Only a few particles
W7071 AT JSC Some picked. Good flag; should pick. Some aerosol/ash
W7072 AT JSC Previously allocated to Walker
W7073 AT JSC Picked some particles. Earlier contamination aero,ash&cryst

W7074 AT JSC Picked 9 mounts. One cluster particle and black sphere left
W7075 AT JSC Backg. of clear and some black spheres. Pickable. Some Contam.
W7076 AT JSC Some contamination. Good flag to pick/excellent cluster
W7077 AT JSC Heavy background. Sim. nuclear blast flown thru 074—082
W7078 AT JSC Heavy background. Sim. nuclear blast flown thru. Contaminat.
W7079 AT JSC Light backg. See W7077. One ~30um sphere. Flag hard to pick
W7080 AT JSC Heavy background. See W7077. Contaminated
W7081 AT JSC Heavy background. See W7077. Contaminated
W7082 AT JSC Heavy background. See W7077. Contaminated
W7083 AT JSC Many hours. Lots of particles. Good flag to pick
W7084 AT JSC Many hours. Lots of particles. Good flag to pick
W7085 AT JSC Many hours. Lots of particles. Good flag to pick
W7086 AT JSC Many hours. Lots of particles. Good flag to pick
W7087 AT JSC Many hours. Lots of particles. Good flag to pick
W7088 AT JSC Many hours. Lots of particles. Good flag to pick
W7089 AT JSC Same as W7087, but much heavier. Possible contamination
W7090 AT JSC Same as W7089. Could be picked if necessary
W7091 AT JSC Contaminated. Ash. No aerosol. Some ash is ~20um
W7092 AT JSC Contaminated. Ash. No aerosol. Ash is ~15um
W7093 AT JSC Contaminated. Ash. No aerosol. Ash is ~15-20um
W7094 AT JSC Contaminated. Ash. No aerosol. Ash ~15/20um
W7095 AT JSC Contam. Ash. No aerosol. Ash ~15/20u. Flag possibly pickable
W7096 AT JSC Contaminated. Ash. No aerosol. Ash is ~15-20um. Pickable
W7097 AT JSC Contaminated. Ash. No aerosol. Ash ~15/20um. Pickable
W7098 AT JSC Contaminated. Ash. No aerosol. Ash ~15-20um. Interesting
W7099 AT JSC Light backg. of ash. No aerosol. Ash is 2um or less. Pickable
W7100 AT JSC Light backg. of ash. No aerosol. Ash 2um or less. Pickable
W7101 FLYNN,G TO FLYNN
W7102 AT JSC Contam. Ash. No aerosol. Ash ~2um. Possibly pickable
W7103 AT JSC Light backg. of ash. No aerosol. Ash ~2um or less. Contam
W7104 AT JSC Light ash background. No aerosol. Possibly other contamin.
W7105 AT JSC Light ash background. No aerosol. Possibly other contamin.
W7106 AT JSC Light background of ash. No aerosol. Flag is pickable
W7107 AT JSC Very light background of ash. No aerosol. Pickable
W7108 AT JSC Very light background of ash. Poss. other contam. Pickable
W7109 AT JSC Slight amount of ash/aerosol. Good flag to pick
W7110 AT JSC Fairly clean to the eye. No ash or aerosol. Pickable
W7111 AT JSC Light aerosol/ash background. Lots of particles. Pickable
W7112 AT JSC Good flag. Lots of parts. Slight aerosol around the notch
W7113 AT JSC Slight background of something. Flag is pickable
W7114 AT JSC Slight background of something. Lots of particles. Pickable
W7115 AT JSC Aerosol. Four hr. flight to Denver from Hou. Some oil miss.
W7116 AT JSC Some oil missing. Some aerosol. Few parts. One good cluster
W7117 AT JSC Few parts. Some oil missing. Some aerosol. Signs of pollen
W7118 AT JSC Housings in bad shape from aerosol. Few particles. Pickable
W7119 AT JSC See W7118. Few particles. Some aerosol. Pickable
W7120 AT JSC See W7118. Coverage of aerosol. Oil thinning. Pickable
W7121 AT JSC See 118. Some aerosol. Some oil miss. 1 good clust. Pickable
W7122 AT JSC Aerosol droplets. Some oil missing. Few particles. Pickable
W7123 AT JSC Some aerosol. No oil miss. Few parts. Poss. ash. Pickable
W7124 AT JSC Some aerosol. No oil miss. Few parts. Poss. ash. Pickable

W7125 AT JSC Aerosol droplets. Some oil missing. Few particles. Pickable
W7126 AT JSC FLOWN IN DIFFERENT POSITIONS OVER THE PERIOD OF TIME
W7127 AT JSC FLOWN IN DIFFERENT POSITIONS OVER THE PERIOD OF TIME
W7128 BROWNLEE,DE FLOWN IN DIFFERENT POSITIONS OVER THE PERIOD OF TIME
W7129 AT JSC FLOWN IN DIFFERENT POSITIONS OVER PERIOD OF TIME
W7130 AT JSC 10 HRS. THEN ANOTHER 25 HRS..DIFFERENT LOCATIONS AND TIME
W7131 BROWNLEE,DE 10 HRS. THEN ANOTHER 25 HRS.,DIFFER. LOC.,AND DEFFER. TIMES
W7132 AT JSC 10 HRS.THEN25 HRS. MORE,DIFFER. LOC.,AND DIFFER. TIMES
W7133 AT JSC 10 HRS, THEN 25 MORE,DIFFER.LOC.,AND DIFFER. TIMES
W7134 AT JSC REMOVING FLAGS AT 38 HOURS
W7135 AT JSC REMOVED AFTER 38 HRS.
W7136 AT JSC INSTALLED 1/28/93,REMOVED 7/2/93—38 HRS.
W7137 AT JSC INS. 1/28/93,REMOV. 7/2/93—38 HRS.
W7138 AT JSC INS.1/28/93,REM. 7/2/93—38HRS.
W7139 AT JSC INS. 1/28/93,REM. 7/2/93—38HRS.
W7140 AT JSC INS. 1/28/93,REM. 7/2/93—38 HRS.
W7141 AT JSC INS. 1/28/93,REM. 7/2/93—38 HRS.
W7142 AT JSC 8/10-10/15/93//POS.1//20HRS.—PLANE HAD BEEN PAINTED.
W7143 AT JSC 20HRS. SET OF W7142—149//PLANE HAD BEEN PAINTED
W7144 AT JSC SET OF W7142—149. PLANE HAD BEEN PAINTED
W7145 AT JSC SET OF W7142—149. PLANE HAD BEEN PAINTED.
W7146 AT JSC SET OF W7142—149. PLANE HAD BEEN PAINTED.
W7147 AT JSC SET OF W7142—149. PLANE HAD BEEN PAINTED
W7148 AT JSC SET OF W7142—149. PLANE HAD BEEN PAINTED
W7149 AT JSC SET OF W7142—149. PLANE HAD BEEN PAINTED
W7150 AT JSC AEROGEL/DID NOT WORK/CONTAM.2 MORE FLGS. WITH IT.
W7151 AT JSC CONTAM. BY THE AEROGEL SAMPLE IN FRONT OF IT.
W7152 AT JSC TAPE/DOESN'T LOOK ALL THAT GOOD. CAN'T SEE ANYTHING
W7153 AT JSC ASLO CONTAM. BY THE AEROGEL/ BUT PICKABLE
W7154 AT JSC GOOD FLAG FOR ONLY 27 HRS./SEE S.O. REPORT/150—157
W7155 AT JSC GOOD FLAG FOR 27 HRS./SEE S.O. REPORT/150-157
W7156 AT JSC GOOD FLG.FOR ONLY 27 HRS./SE S.O. REPORT/150-157
W7157 AT JSC GOOD FLG. FOR 27 HRS./SEE S.O. REPORT/150-157
W7158 AT JSC 1/6/95-ONLY 12HRS./TO 4/24/95-56HRS. HAWAII
W7159 AT JSC COL#8 ON 1/6/95 ONLY 12HRS./TO 4/24/95 ANOTHER 58HRS//HAWAII
W7160 AT JSC COL#2 1/6/95 ONLY 12HRS./TO4/24/95 58HRS.MORE.HAWAII
W7161 AT JSC COL#10. 1/6/95 ONLY 12HRS. TO 4/24/95 58HRS. MORE. HAWAII.
W7162 AT JSC COL#13. 1/6/95 ONLY 12HRS.TO 4/24/95 56 HRS MORE. HAWAII.
W7163 AT JSC COL#4.1/6/95 ONLY 12HRS. TO 4/24/95 56 HRS. MORE. HAWAII
W7164 AT JSC COL#9. 1/6/95 ONLY 12HRS. 4/24/94 58HRS MORE. HAWAII
W7165 AT JSC COL#14. 1/6/95 ONLY 12HRS. 4/24/95 56HRS MORE. HAWAII
W7166 AT JSC 2 COLLECTORS//TEX-NEV-CAL//CAL-NEV-TEX//4/48/95-7/28/95
W7167 AT JSC 2 COLLECTORS//TEX-NEV-CAL/CAL-NEV-TEX//4/28/95-7/28/95
W7168 AT JSC COLLECTOR #2 IN #1 POS. FLOWN FOR 64.5 HRS.
W7169 AT JSC COLLECTOR#14 IN #2 POS. FLOWN FOR 64.5 HRS.
W7170 AT JSC FLOWN THROUGH TITAN4 PLUME//ALLOCATED TO N. PRESSER
W7171 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER
W7172 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER
W7173 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER
W7174 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER
W7175 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER

W7176 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER
 W7177 AT JSC FLOWN THROUGH TITAN 4 PLUME//ALLOCATED TO N. PRESSER
 W7178 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME.
 W7179 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME
 W7180 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME
 W7181 AT JSC FLOWN 18/20 SEC THROUGH TITAN PLUME
 W7182 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME
 W7183 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME
 W7184 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME
 W7185 AT JSC FLOWN 18/20 SEC. THROUGH TITAN PLUME
 W7186 AT JSC 45HRS. TOTAL FLIGHT TIME. POSITION #1.
 W7187 AT JSC TOTAL OF 50HRS. OF FLIGHT TIME. POSITION #2.
 W7188 AT JSC TOTAL FLIGHT OF 35HRS.POSITION #8.
 W7189 AT JSC 7/17-10/3/96 FOR 40HRS//COLLECTOR#11 IN #1 POS.
 W7190 AT JSC 7/17-10/3/96 FOR 40HRS///COLLECTOR #5 IN #2 POS.
 W7191 AT JSC 7/17-10/3/96 FOR 40 HRS///COLLECTOR #2 IN #7 POS.
 W7192 AT JSC 7/17-10/3//96 FOR 40 HRS.///COLLECTOR#8 IN POS. #8
 W7193 AT JSC DELTA PLUME; 2nd PASS, POSSIBLE OPEN TO GROUND
 W7194 AT JSC DELTA PLUME; 1st PASS
 W7195 AT JSC DELTA PLUME; 1st PASS
 W7196 AT JSC DELTA PLUME; 2nd PASS, OPEN TO GROUND
 W7197 AT JSC DELTA PLUME;2nd PASS, OPEN TO GROUND
 W7198 AT JSC DELTA PLUME; 1st PASS
 W7199 AT JSC DELTA PLUME; 1st PASS
 W7200 AT JSC DELTA PLUME; 2nd PASS, OPEN TO GROUND

Renumbered Chondritic Interplanetary Dust Particles

Old Number	New Number	Old Number	New Number	Old Number	New Number
U2011 A 2	U2011*A 1	W7029 K 2	W7029*B 8	W7069 B 3	W7069*A 3
U2011 A 4	U2011*A 2	W7031 A 1	W7031*A 1	W7071 A 1	W7071*A 2
U2011 A 5	U2011*B 1	W7031 A 2	W7031*B 1	W7071 A 2	W7071*A 1
U2015 A 1	U2015*A 1	W7031 A 5	W7031*C 1		
U2015 A 2	U2015*A 2	W7031 A 9	W7031*D 1		
U2015 A 3	U2015*A 3	W7031 E 1	W7031*A 3		
U2015 A 8	U2015*B 1	W7031 E 2	W7031*C 2		
W7010 A 8	W7010*A 1	W7031 E 3	W7031*B 2		
W7010 C 1	W7010*A 3	W7031 E 4	W7031*B 3		
W7010 C 2	W7010*A 4	W7066 A 1	W7066*A 1		
W7010 C 4	W7010*A 5	W7066 A 5	W7066*A 2		
W7026 A 1	W7026*A 1	W7066 B 1	W7066*A 3		
W7028 A 4	W7028*C 1	W7066 B 2	W7066*A 4		
W7028 D 1	W7028*C 2	W7069 A 1	W7069*A 1		
W7029 B13	W7029*B 1	W7069 A 2	W7069*B 2		
W7029 C 1	W7029*A 1	W7069 B 1	W7069*B 2		
W7029 K 1	W7029*A27	W7069 B 2	W7069*A 2		

List of Available Interplanetary Dust Samples

L2001 A 8
L2005 A 1 6
L2005 B 9 13 15 16
L2005 C 3 16
L2005 D 1 2 21 24
L2005 E 1 3 30
L2005 F 2 4 32 34 36
L2005 G 1 2 3 38 42
L2005 H 1 43 44 45 48
L2005 I 4 7 13 19 24
L2005 J 2 4 6 7 8 9 10 12 15 16 17 18 19 21 23 25
L2005 K 1 4
L2005 L 1
L2005 N 1 4 6 7
L2005 O 2 5 7 10
L2005 P 4 8 10 11 15
L2005 Q 3
L2005 R 2 3 4
L2005 S 8
L2005 T 1 3 6 7 8 10 14 16
L2005 U 2 3 4 7 8 9 10 12 13 14 15 16 17
L2005 V 1 2 3 4 5 6 7 8 9 10 11 12 14 16 18
L2005 W 1 2 3 4 5 6 7 8 9 10 11 12 14 15
L2005 X 1 2 3 4 5 6 7 8 9 10 12 13 14 16
L2005 Y 1 2 3 4 7 8 9 10 11 12 13 17 18
L2005AB 4 5 6 7 8 9 10 11 12 13 14 15 17
L2005AC 1 2 3 5 6 7 8 9 10 12 13 14 15
L2005AD 1 2 3 4 6 7 8 9 10 11 12 13 15 16 19 20 21 22 23 24
L2005AE 1 2 3 5 7 9 10 13 15 16
L2005AF 1 2 3 4 6 7 8 9 13 14 15 16 17 18
L2005AG 1 2 3 4 5 6 7 8 9 10 12 13 15 16
L2006 A 1 2 4 5 8 9 10 11 13 14 16 17
L2006 B 1 2 3 4 5 6 12 13 14 17 18
L2006 C 1 2 6 7 8 9 10 11 14 16 17
L2006 D 1 2 4 5 6 8 9 10 11 12 14 15
L2006 E 4 5 6 9 11 12 14
L2006 F 1 2 3 5 6 8 11 13 14
L2006 G 3 4 6 7 8 9 10 11 12 13
L2006 H 1 2 3 4 6 8 9 10 12 13 14 15 16 17 18
L2006 I 1 2 3 4 5 6 7 8 11 12 13 14 15 16 17 18
L2006 J 1 2 3 4 6 8 10 12
L2006 K 1 2 3 4 5 6 10 11
L2006 L 1 2 3 5 6 7 8 9 10 12 13 14 15 16 18
L2006 M 2 3 4 6 7 8 9 10 11 13 14 15 16
L2006 N 2 3 6 7 8 9 10 11 12 13 14 15 16
L2006 O 1 2 4 6 7 8 9 13 14
L2006 P 1 2 3
L2008 A 1 3 4 5 6 7 8 9

L2008 B 1 2 3 4 5 6
L2008 C 1 2 3 4 5 6 7 8 9 10
L2008 D 1 2 3 4 5 6 7 8 9 10 11
L2008 E 1 2 4 6 7 9 10 11 12 13 14 15 16
L2008 F 1 2 6 8 9 10 11 12 15
L2008 G 1 2 3 7 8 14 16
L2008 H 1 2 3 5 6 7 8 10 11 12 15
L2008 I 1 2 3 4 5 6 7 8 9 11 12 13 14
L2008 J 2 3 7 8 9 13 14 15 16
L2008 K 1 2 3 5 7 8 9 11 13 14
L2008 L 1 3 5 6 7 10 12 14 15 16
L2008 M 1 3 5 6 7 8 11 12 14 15
L2008 N 1 2 3 4 5 6 7 8 10
L2008 O 2 3 4 5 6 7 9 10 11 12 13 14 15 16
L2008 P 2 3 4 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
L2008 Q 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
L2008 R 1 2 3 4 5 6 7 8 9 10 11 12 13 16
L2008 S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
L2008 T 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
L2008 U 1 2 3 4 5 6 7 9 10 11
L2008 V 1 2 3 4 5 6 7 8 9 10 12 13 15 16 17 18 19 20 22 23 24 25 26 27 28 29 30 31 32 33 34 35
L2008 W 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 22 23 24 25 26 27 28 29 30 31 32 33 34 35
L2009 A 1 2 3 4 5 6 7 8
L2009 B 1 2 3 4 5 6 7 8 9
L2009 C 1 3 4 5 6 7 9 10 11 15
L2009 D 3 4 6 9 10 12 13
L2009 E 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
L2009 F 2 3 4 5 6 7 8 11 13 15 16 17 18 19 20 21 23 24 25 27 28 29 30 31 32
L2009 G 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 21 22 23 24 25 26 27 28
L2009 H 1 2 3 4 5 6 8 9 12 13 14 15 16
L2009 I 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
L2009 J 1 3 6 7 8
L2009 K 2 4 5 6 7 10 11 12 13 15 16 18 19
L2009 L 1 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
L2011 A 1 2
L2011 B 4
L2011 C 1 2 3 4 7
L2011 D 1 2 3 4
L2011 E 1 2 3 4 5 6 7
L2011 F 1 2 3
L2011 G 1 2 3 4 5 7 8 9 10 11 12
L2011 H 1 2 3 4 5 6 7 8 9 10 11 12 13
L2011 I 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
L2011 J 3 4 5 6 7 8 9 10 11 12 14 15
L2011 K 2 3 4 6 8 9 10 11 12 13 14 15 16
L2011 L 1 3 5 6 7 8 9 10 11
L2011 M 1 2 3 4 6 7 9 10 11 12 13 14 15
L2011 N 2 4 5 9 10 11 12 14 15
L2011 O 2
L2011 P 1 2 6 8 9 10 14
L2011 Q 1 2 3 6 10 11 12 14
L2011 R 2 4 5 6 8 9 10 12 14

L2011 S 1 2 3 5 6 7 9 10 11 12
L2011 T 1 2 4 5 6 7 8 9 10
L2021 A 1 2 3 4 5 6 7
L2021 B 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
L2021 C 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
L2021 D 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
L2021 E 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
L2021 F 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
L2021 G 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
L2021 H 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
L2036 A 1 2 3 4 5 6
L2036 B 1 2 3 4 5 6 7 8
L2036 C 1 2 3 4 5 6 7 8 9 10 11 12 13
L2036 D 1 2 3 4 5 6 7 8 9 10
L2036 E 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
L2036 F 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
L2036 G 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
L2036 H 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
L2036 I 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
L2036 J 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
L2036 K 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
L2036 L 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
L2036 M 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
L2036 N 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
L2036 O 1 2 3 4 5 6 7 8 9 10
U2001 A 1 2 4 6 10 11 13 14 15 16 18 19 20
U2001 B 7 12 16
U2001 C 2 3 5 9 12 13 14 17
U2001 D 1 2 3 5 6 9 10 13 14 18 19
U2001 E 1 4 6 7 11 12 13 14 15 17 18 19 20
U2011 A 1 3 6 7 8 9 10 11
U2011 C 6 8 9
U2011*A 1 2
U2013 A 1 2
U2015 A 4 5 6 7
U2015 B 1 2 4 5 6 7 12 13 15 16 17
U2015 C 1 2 3 6 7 9 10 12 14 15 17 18 19 20 21 22 23
U2015 D 1 2 3 4 5 7 8 9 12 13 14 15 17 18 19 20 23 24 25
U2015 E 5 6 11 12 13
U2015 F 4 7 8 9 10 13 14 17 18 19 21 22
U2015 G 6 7
U2015*A 1 2 3
U2017 A 3 6 7 12
U2018 A 1 2 3 4 5 6
U2022 A 1 2 4 5
U2022 B 3 6 7 8 9 11 20 22 23 24 25
U2022 C 3 4 5 6 10 11 12 15 16 21
U2022 D 5 10 13 16 17
U2022 E 10 13 14 18 20 21 22 23 27 28 29 30 31
U2022 F 1 2 7 8 12 14 15 16 19
U2022 G 4 5 6 11 12 15 16 21 22 24

U2034 A 1 4 5 6 7 8 9 10 11 12 13 14 15 16 18 19 20 21 22 23
U2034 B 3 4 7 8 9 10 11 12 13 14 15 16 17 19
U2034 C 3 4 7 8 9 10 11 14 15 16 18 19
U2034 D 5 6 8 9 10 11 12 14 15 16 17
U2034 E 1 4 6 7 10 11 12 13 15 18 19 20 21
U2034 F 5 7 9 11 12 14 15 16 19 20 22 23 25 28 29 30
W7010 C 3 5
W7010*A 3 4 5
W7013 A 4 5 6 9 13 16 17 18 19 20 21
W7013 B 2 3 4 8 12 16 18 19
W7013 C 1 3 4 5 7 8 9 11 13 17
W7013 D 3 5 6 10 14 15 16 17
W7013 E 1 2 5 6 7 12 18
W7013 F 1 2 3 7 10 14 15 16 17
W7013 G 4 5 7 12 13 14 15 16
W7013 H 3 6 7 8 9 10 12 13 15 19 20 21 22 23
W7017 B 15
W7017 C 1 3 4 6 7 8 9 10 11 12 16 17
W7017 D 5 7 8 11 12
W7017 F 1 2 6 7 8 9 11 12 13 14
W7017 G 2 5 7 9 11 16
W7026 A 2 3
W7026 B 1 2
W7027 A 2 3 6 7 14 18
W7027 B 11 16
W7027 C 6 8 9 11 13 15 16
W7027 D 1 3 5 6 9 11 12 13 14 15 16 17 18
W7027 E 3 4 5 13 14 15 16
W7027 F 1 2 4 5 6 7 8 9 10 13 14 15 16 18 19 20
W7027 G 1 2 3 4 5 6 7 8 9 10 11 12 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
W7027 H 3 5 6 7 8 9 12 13 16 18
W7027 I 1 2 3 4 5 6 7 8 9 10 11 12 13 14
W7028 A 1 2 5 6 7 8 9 10 11 12 13
W7028 D 2 3 4 5 6 7
W7029 A 1 2 3 4 5 6 8 9 11 12 13 14 15 16 17 18 19
W7029 B 6 7 8 10 15 16
W7029 C 10
W7029 D 1 2 3 4 5 6 8 9 10 11 12 13 15 16
W7029 E 1 2 6 9 15
W7029 F 1 2 3 5 6 8 10 16
W7029 G 1 5 6 7 8 12 13 16
W7029 H 1 2 3 5 12 14 16 17 18
W7029 I 2 3 4 5 7 9 10 11 12 15 16 17 20
W7029 J 2 5 8 11 12 13 14 15 16 18 19 20
W7029 K 3
W7029*A 3 4 5 6 7 9 10 11 14 18 19 20 21
W7029*B 1 3 8
W7031 A 3 4 6 7 8 10 11 12 13 14
W7031 B 1
W7031*A 1

W7031*B 2 3
W7032 A 1 2 3 4 5 6 7
W7036 B 1 2 3 4 5 6
W7066 A 2 3 4
W7066 B 3 4
W7066*A 1
W7068 A 1 2 3
W7069*A 1 2 3
W7069*B 2
W7071 B 1 2 3
W7071*A 1 2
W7073 A 1
W7074 A 1 2 3 4 8 9 10 11 12 13 15 16 18 20 21 24 25 27
W7074 B 2 3 6 7 8 9 12 15 16 17 18 19 20 21 22 23 24
W7074 C 1 4 6 10 11 12 14 16 18 19 20 21 22 23
W7074 D 2 6 8 9 12 14 19
W7074 E 1 3 4 8 9 10 18
W7074 F 1 2 3 4 5 7 8 10 11 14 15 16
W7074 G 1 2 4 5 6 8 9 11 13 14 15 16 17
W7074 H 2 5 6 7 11 12 13 14 15
W7074 I 1 2 3 4 7 12 13 14 16

Available Solar Maximum Samples

For complete itemized listing of available Solar Maximum Satellite samples, please refer to the *Dust Courier* No. 11, August 1994.

Available EURECA Sample

EU464 Thermal Blanket

Availability of the Trek Blanket Flown on the MIR Space Station

A principal goal of NASA is to further detailed research into the nature of particulates in low-Earth orbit, and the effects of their impact onto spacecraft materials. Towards this goal, we have carefully selected a large variety of space-exposed materials from several satellites containing impact features, and returned them to the Curatorial Facility at the Johnson Space Center (JSC). These satellites are the Long Duration Exposure Facility (LDEF), Solar Maximum, Palapa, and European Recoverable Carrier (EURECA). This spring we obtained a thermal blanket which was exposed on the MIR Space Station for a period of approximately 4 years (from June 29, 1991 to August 19, 1995).

The blanket covered the Trek cosmic ray detection experiment, and was obtained for study in collaboration with the RSC Energia in Russia. An existing cooperative agreement between NASA and Russian investigators covers the initial survey, curation and allocation of this blanket. Under the terms of this agreement initial optical, non-destructive surveys have located 38 impact features on approximately 1 m² of blanket. The blanket has a top layer of beta-cloth, and four succeeding layers of aluminized kapton, and measures approximately 2 by 1 m²; only half was actually exposed. The figure shows the overall appearance of the blanket; numbers indicate the

Impact Features Located on the Trek Blanket

Initial surveys performed at the RSC Energia and Johnson Space Center located 38 impact features. These surveys were performed by Mariam R. Kondratieva and Jack Warren. The blanket has a brown tint to it, probably from solar UV radiation. Due to this discoloration, a thin film or coating of something, and the woven fabric splitting in some places, the blanket was hard to scan with perfection. Also, the woven blanket fabric has split in half, making it very difficult to survey by many techniques. Therefore impacts features may have been missed during the preliminary survey.

Features

- 1) Damaged area ~ = 650um

Hole size ~ = 350um

Loc. left side, 3 full sq. up, 1st full sq. over

X = 55um

Y = 73um

Description: Impact penetrated all the way through the blanket. The underside has a split in it and the material has been frosted by the hot gases and debri. Not much melted strains of material where the impact took place. You could see the hole from the gold foil underneath the first layer of material. Most of the impacts found were easily seen do to the brownish tint on the fabric where the impact occurred. Lots of residue in the material, but most likely to be contamination.

- 2) Damaged area ~ = 600um

Hole size ~ = 400um

Loc. right side, 3 full sqs. up, 1st sq. in.

X = 70um

Y = 127um

Description: Same as above. Also penetrated all the way through. Still not much melt on the fabric ends where the impact went through. Again the hole was noticed because of the gold foil shining through the hole.

- 3) Damaged area ~ = 300um

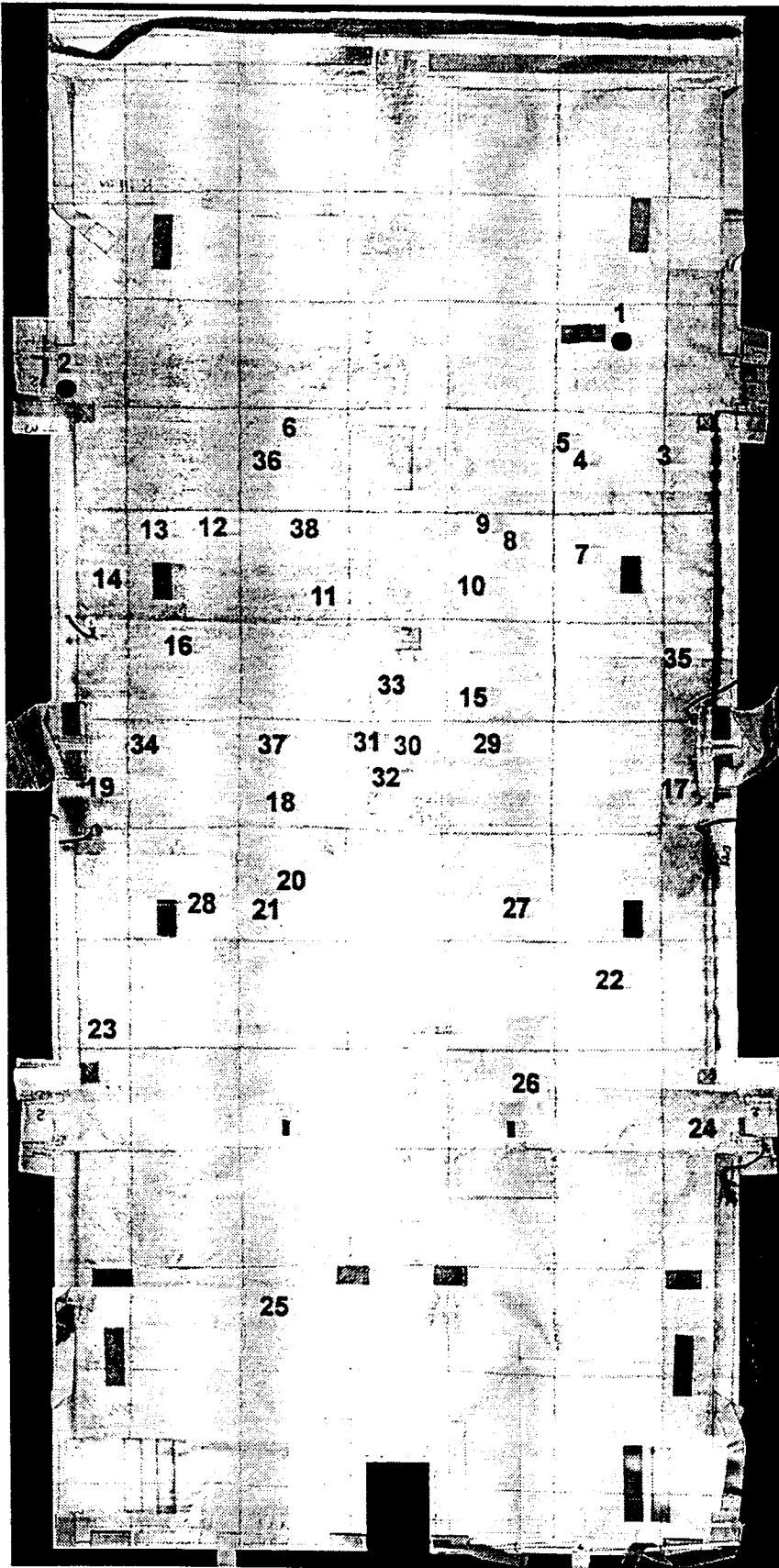
Hole size ~ = 200um

Loc. left side 4 full sqs. up, 1st sq. to right, inside the zero mark.

X = 56um

Y = 78um

Description: You can see the melt on the ends of he fiber on this impact. You also have a brownish tint to the impact.



location of the known impact features. Two impactors (circles on the figure) appear to have completely penetrated the blanket. It would be interesting to study the top of the Trek glass cosmic ray detector plates for impactor residue from the penetrating grains. Note also that the MIR (and therefore the blanket) was not in a constant orientation with respect to the velocity vector.

The Trek blanket has been stored in the Facility for the Optical Inspection of Large Surfaces (FOILS Lab) at the Johnson Space Center. The FOILS Lab is a dedicated facility for the storage and preliminary examination of space-exposed surfaces, and occupies class 10,000 clean room. The cleanliness of this facility thus exceeds that provided by the class 100,000 clean room used to house typical space hardware during integration and deintegration activities, and therefore introduces minimal additional contamination to the blanket.

The accompanying table lists and describes the impact features which have been located on the blanket. We invite requests from qualified workers for further analyses of the Trek blanket, either in whole or in part. The disposition of the blanket will be decided, in light of these requests, in August 1996 by a peer review committee consisting of the NASA Curator and scientists from the RSC Energia. Interested individuals should prepare a request as they would for any NASA curated hardware, following the directions given elsewhere in this publication.

Space Hardware Sample Curation and Sample Availability

A principal goal of NASA is to further detailed research into the nature of particulates in low-Earth orbit, and the effects of their impact onto spacecraft materials. Towards this goal, we have carefully selected a large variety of space-exposed materials from several satellites containing impact features, and returned them to the Curatorial Facility at the Johnson Space Center (JSC). These satellites are the Long Duration Exposure Facility (LDEF), Solar Maximum, Palapa, the European Recoverable Carrier (EURECA), and the Trek blanket from the MIR space Station (described below). These surfaces thereby join lunar samples, Antarctic meteorites, interplanetary dust, and surfaces from the Solar Maximum and Palapa spacecraft as an additional source of extraterrestrial and space debris materials for scientific study. In addition, investigators wishing to characterize the type and amount of spacecraft debris will find materials of interest that can be utilized to address these goals.

All selected returned space hardware surfaces have been stored in the Facility for the Optical Inspection of Large Surfaces (FOILS Lab). The FOILS Lab is a dedicated facility for the storage and preliminary examination of space-exposed surfaces, and occupies class 10,000 clean room. The cleanliness of this facility thus exceeds that provided by the class 100,000 clean room used to house the space

- 4) Damaged area ~ = 350um
Hole size ~ = 150um
Loc. left side, 4 full sqs. up, 1st full sq. over.
X = 104um
Y = 95um

Description: Same as above. Brownish tint and lots of melt of the fabric.

- 5) Damaged area ~ = 450um
Hole size ~ = 200um
Loc. left side, 4 full sqs. up, 1st full sq. over.
X = 142um
Y = 82um

Description: Same as above. Lots of melted ends of the fabric and the brownish tint is a lot darker on this impact.

- 6) Damaged area ~ = 250um
Hole size ~ = 125um
Loc. right side 4 sq. up, 2nd full to left.
X = 82um
Y = 22um

Description: Very light brown, damaged area not to bad, some melt of the fibers.

- 7) Damaged area ~ = 400um
Hole size ~ = 125um
Loc. left side 5 sqs. up, 1st full sq. over.
X = 104um
Y = 83um

Description: Possible angle entry. Good brownish tint to it. Lots of melted fibers. Could not see any residue on the top layer.

- 8) Damaged area ~ = 225um
Hole size ~ = 100um, but not that defined.
Could just be a crater impact.
Loc. left side, 5 full sqs. up, 2 full sqs. over.
X = 45um
Y = 25um

Description: Burned pretty good, lot of melted fibers. 1st layer of material does have some darkness to it, which may be possible residue.

- 9) Damaged area ~ = 550um
Hole size ~ = 300um
Loc. left side, 5 full sqs. up, 2 full sqs. over.
X = 73um
Y = 20um

Description: Light brown tint. Lots of melted area, possible angle entry. Large damaged area, could see the gold foil underneath. Possible some residue in the melt.

- 10) Damaged area ~ = 250um
Hole size ~ = 100um
Loc. left side 5 full sqs. up, 2 full sqs. over.
X = 88um
Y = 92um

Description: Light brown. Very clean looking, but does have some melted fibers. Possible angle entry, no residue.

- 11) Damaged area ~ = 500um
Hole size ~ = 300um
Loc. right side, 5 full sq. up, 2 full sqs. over.
X = 65um
Y = 133um

Description: fair amount of melt, but clean looking. Possible residue.

- 12) Damaged area ~ =300um
Hole size ~ = um* This is a crater and not a hole.
Loc. right side, 5 full sqs. up, 1 sq. over
X = 43um
Y = 25um

Description: Looks to have lots of residue. Lot of brown area, one real dark brown fiber.

- 13) Damaged area ~ = 300um
Hole size ~ = 150um
Loc. right side, 5 full sqs. up, 1 sq. over.
X = 119um
Y = 28um

Description: Not very brown, but not much melt. No residue.

- 14) Damaged area ~ = 700um
Hole size ~ = 300um
Loc. right side, 5 full sqs. up, in the ½ sq.
X = 14um
Y = 87um

Description: Dark brown, lots of melt. No residue. Possible angle entry.

- 15) Damaged area ~ = 300um
Hole size ~ = 100um
Loc. left side, 6 sqs. up, 2 full sqs. over.
X = 82um
Y = 134um

hardware during integration and deintegration activities.

The accompanying tables list returned space hardware hardware received at JSC for curation by July, 1996, and which are still available for allocation and examination. We expect that more materials will be added to the curated materials list as time progresses.

Reports and Information Available from the Curator as Hard Copies, on CD-ROM and Over the Internet

Limited numbers of three reports dealing with the LDEF meteoroid and space debris impact record are available from the Curator, NASA JSC (see address below). These reports are:

See T, Allbrooks M, Atkinson D, Simon C and Zolensky M (1990) *Meteoroid and Debris Impact Features Documented on the Long Duration Exposure Facility*. JSC Publ. 24608, 586p.

Coombs C, Watts A, Wagner J and Atkinson D (1992) *LDEF Data: Comparisons with Existing Models*. NAS9-17900 Final Report 1. 42p.

Allbrooks M and Atkinson D (1992) *The Magnitude of Impact Damage on LDEF Materials*. NAS9-17900 Final Report 2. 82p.

Meteoroid & Debris data are also available on CD-ROM, as described in Dust Courier 11, and on line at the Curator's homepage:

<http://www-curator.jsc.nasa.gov/curator/curator.htm>

Guidelines for Preparing a Request for Returned Spacecraft Hardware Samples

All of the space hardware surfaces obtained by NASA for curation described below are available for allocation to qualified investigators. Each of these samples remains the property of NASA and/or the original satellite "owners", and its study is conditional upon regulations embodied in various memoranda between the original owners and NASA. One universal requirement covering the study of any returned spacecraft surface is that all data obtained will be published in the open literature and also provided to NASA for entry into the Meteoroid and Debris Database. All sample allocations will be made for a period of up to two years, with the samples returning to the JSC Curatorial Facility at the end of this time.

Scientists desiring to perform detailed research on samples curated at the Johnson Space Center should apply in writing to:

Curator of Returned
Space Hardware
Code SN2
NASA/Johnson Space Center
Houston, Texas 77058
U.S.A.

Phone (281) 483-5128
FAX (281) 483-5347
e-mail:
zolensky@ems.jsc.nasa.gov

Sample requests should refer to specific sample-identification numbers and should describe the research being proposed as well as

Description: Light brown, but clean. Some melted fibers.

- 16) Damaged area ~ = 125um
Hole size ~ = um* This is not a hole.
Loc. right side, 6 sqs. up, 1 sq. over.
X = 87um
Y = 31um

Description: Light brown crater. Clean looking

- 17) Damaged area ~ = 500um
Hole size ~ = 300um
Loc. left side, 7 sqs. up, in ½ sq.
X = 33um
Y = 82um

Description: Light to dark brown, lots of melt. No residue. Can see gold foil.

- 18) Damaged area ~ = 150um
Hole size ~ = um* This is not a hole.
Loc. right side, 7 sqs. up, 2 sqs. over.
X = 86um
Y = 120um

Description: Slightly dark. Hard to see the any melt. Could be a puncture.

- 19) Damaged area ~ = 400um
Hole size ~ = 300um
Loc. right side, 7 sqs. up, in the ½ sq.
X = 39um
Y = 96um

Description: Very clean. Possible low impact, not much here. Very little melt.

- 20) Damaged area ~ = 250um
Hole size ~ = um* This is not a hole
Loc. right side, 8 sqs. up, 2 sqs. over.
X = 74um
Y = 74um

Description: Brown, lots of melt. No residue.

- 21) Damaged area ~ = 250um
Hole size ~ = um* This is not a hole.
Loc. right side, 8 sqs. up, 2 sqs. over.
X = 102um
Y = 79um

Description: Clear to brown, possible low speed. Looks to have residue in the melted fibers.

- 22) Damaged area ~ = 300um
Hole size ~ = 200um
Loc. left side, 9 sqs. up, 1st full sq. over.
X = 46um
Y = 44um

Description: Light brown, very little melt, no residue.

- 23) Damaged area ~ = 300um
Hole size ~ = 200um
Loc. right side, 9 sqs. up, in the ½ sq.
X = 30um
Y = 124um

Description: Not much color or melt. No residue.

- 24) Damaged area ~ = 300um
Hole size ~ = 200um
Loc. left side, 10 sqs. up, in the ½ sq.
X = 28um
Y = 91um

Description: Not much color or melt. No residue. Clean looking. Hole almost the same size as the damaged area, so could be a puncture or low impact.

- !!25) Damaged area ~ = 350um
Hole size ~ = 250um
Loc. right side, 12 sqs. up, 2 full sqs. over.
X = 118um
Y = 64um

Description: Not much color or melt. No residue.

!! This part of the blanket was folded under and should not have received an impact. So most likely this is a mechanical puncture.

- 26) Damaged area ~ = 300um
Hole size ~ = 100um
Loc. left side, 10 sqs. up, 2 full sqs. over.
X = 52mm
Y = 58mm

Description: More like a crater than a hole, very rough, some brown tint, can not tell if it really penetrated the blanket.

- 27) Damaged area ~ = 250um
Hole size ~ = 150um
Loc. left side, 8 sqs. up, 2 full sqs. over.

the qualifications and facilities of the investigator making the request. All requests are reviewed by a peer committee, and are subject to its approval. Approval of a sample request does not imply or include funding for the proposed research. Foreign scientists are welcome to request samples.

Tabulation of Curated LDEF Surfaces

The Surface Name, "Primary Surface Name", or Surface is a six-character designation for each LDEF experiment surface. The first three characters give the tray location (e.g., A01 would be Bay A on Row 01). The fourth character is always a letter designation for the type of surface, called a "Component". The final two numbers in each Surface Name give the number of the specific surface. All of the experiment trays were composed of several to many separate surfaces, all of which were named separately. Thus, the Surface Name C01E01 would indicate experiment (E) surface number 01 from experiment Bay C on Row 01.

Additional Teflon Thermal Blanket Samples

In addition to the one-third sections of each A0178 Teflon blanket curated by NASA, the remaining two thirds of each of these blankets is being maintained in Europe by ESTEC. Individuals wishing information concerning the possible analysis of portions of these blankets should contact Prof. J.A.M. McDonnell, and send a copy of all communications to Dr. K.-P. Wenzel (see addresses on following page).

Prof. J.A.M. McDonnell
Unit for Space Sciences
Physics Labs-University of Kent
CT2 7NR United Kingdom

Dr. K.-P. Wenzel
Space Science Dep.
ESTEC
Noordwijk
The Netherlands 2200AG

Investigators Who Have Received Returned Space Hardware Samples

Dale Atkinson
POD Associates, Inc.
Albuquerque, NM

Donald E. Brownlee
Dept. of Astronomy
University of Washington
Seattle, WA

William Carey
Washington University
St. Louis, MO 63130

Christian Durin
CNES Toulouse, FRANCE

Harry Dursch
Boeing Defense & Space Group
Seattle, WA

David Felbeck
Mechanical Engineering Dept.
University of Michigan
Ann Arbor, MI

John Gregory
Department of Chemistry
University of Alabama
Huntsville, AL

William H. Kinard
NASA/Langley Research Center
Hampton, VA

X = 70um
Y = 95um

Description: Hard to see with the naked eye, some brownish tint, and some melted end of the fibers.

28) Damaged area ~ = 150um

Hole ~ = This is not a hole, Crater.
Loc. right side, 8 sqs. up, 1 sq. over.
X= 35mm
Y= 84mm

Description: Lots of melt, and some brown tint.

29) Damaged area ~ = 175um

Hole ~ = 100um
Loc. left side 7 sqs. up, 2 full sqs. over.
X= 89mm
Y= 20mm

Description: No tint, no melt, but a damaged area, possible impact.

30) Damaged area ~ = 650um

Hole ~ = 300um
Loc. middle sqs. 7 up.
X= 35mm
Y= 15mm

Description: some melt, not much tint.

31) Damaged area ~ = 325um

Hole ~ = 150um
Loc. middle sqs., 7 sqs. up.
X= 108mm
Y= 15mm

Description: Brownish tint, lots of melt of the fabric.

32) Damaged area ~ = 300um

Hole ~ = 200um
Loc. middle sqs., 7 up.
X= 82mm
Y= 60mm

Description: Lots of melt, some brownish tint.

33) Damaged area ~ = 150um

Hole ~ = Not a hole, possible crater.
Loc. middle sqs., 6 up.
X= 80mm
Y= 134mm

Description: This one is questionable.

34) Damaged area ~ = 150um

Hole ~ = 50/75um

Loc. right side, 7 sqs. up, 1 sq. over.

X= 103mm

Y= 25mm

Description: Possible angle entry, light brown, small.

35) Damaged area ~ = 425um

Hole ~ = 200um

Loc. left side, 6 sqs. up, in ½ sq.

X= 10mm

Y= 80mm

Description: Large damaged area, lot of the film blown away (the blanket seems to have been sprayed with a protected coating to protect it from something, this is what has been blown away.)

36) Damaged area ~ = 250um

Hole ~ = 100um

Loc. right side, 4 sqs. up, 2 full sqs. over

X= 138mm

Y= 98mm

Description: This is a crater or the fabric fibers have folded back over the hole. Possible debri at 11:00.

37) Damaged area ~ = 300um

Hole ~ = 150um

Loc. right side, 7 sqs. up, 2 full sqs. over.

X= 75mm

Y= 45mm

Description: Lots of melt. Can see the gold foil under the top layer, brown tint.

38) Damaged area ~ = Possible Crater

Hole ~ = This is not a hole.

Loc. right side, 5 sqs. up, 2 full sqs. over.

X= 100mm

Y= 17mm

Description: Should be looked at. Might just be a flaw in the fabric.

J. A. M. McDonnell
Physics Laboratory
Unit for Space Sciences
University of Kent
United Kingdom

David McKay
NASA Johnson Space Center
Houston, TX 77058

Darren McKnight
United States Air Force Academy
Colorado Springs, CO 80840

Lawrence Murr
Department of Metallurgical and
Materials Engineering
University of Texas
El Paso, TX

Clifford A. Paiva
Air Force Astronautics Laboratory
Edwards Air Force Base, CA
93523

Gary Pippin
Boeing Aerospace, Seattle, WA

Seth Shepherd
Arnold Air Force Base, TN

Steve Sutton
Brookhaven National Laboratory
Upton, NY

Mr. Patrick Tevlin
Ontario Science Centre
Don Mills, Ontario, Canada

Tim Wise
Ball Corporation, Boulder CO
80306

Kazuo Yamakoshi
Institute for Cosmic Ray Research
The University of Tokyo
Tokyo, Japan

Michael Zolensky
NASA/Johnson Space Center
Houston, TX 77058

Itemized List of Available LDEF Samples - Cores

Surface Name	Feature Number	Layer Number	Brief Description of Impact Substrate	Core Number (Curatorial #)
A01E00,	4		GRAPHITE COMPOS	LD-114
A01E00,	5		GRAPHITE COMPOS	LD-113
A01E00,	8		GRAPHITE COMPOS	LD-115
A01E00,	9		GRAPHITE COMPOS	LD-116
A03T02,	1		AL	LD-265
A03T02,	2		AL	LD-267
A03T02,	3		AL	LD-269
A03T02,	4		AL	LD-270
A03T02,	6		AL	LD-266
A03T02,	7		AL	LD-268
A07E00,	8		GRAPHITE COMPOS	LD-117
A07E00,	14		GRAPHITE COMPOS	LD-118
A07E00,	17		GRAPHITE COMPOS	LD-119
A07F01,	2		TAPE LIFT	LD-65
A08F01,	2		TAPE LIFT	LD-57
A09F01,	7		TAPE LIFT	LD-81
A09T01,	5		AL	LD-262
A09T01,	6		AL	LD-262
A09T01,	7		AL	LD-262
A09T01,	8		AL	LD-263
A09T01,	9		AL	LD-263
A09T01,	10		AL	LD-263
A09T01,	11		AL	LD-263
A09T01,	12		AL	LD-264
A09T01,	13		AL	LD-264
A09T01,	14		AL	LD-264
A09T01,	15		AL	LD-264
A09T01,	25		AL	LD-261
A09T01,	26		AL	LD-261
A09T01,	27		AL	LD-261
A09T01,	28		AL	LD-260
A10F01,	2		TAPE LIFT	LD-76
A11F02,	2		TAPE LIFT	LD-75
A12F01,	2		TAPE LIFT	LD-46
A12F01,	3		TAPE LIFT	LD-47
B06F01,	3		TAPE LIFT	LD-61
B06F01,	3		TAPE LIFT	LD-84
B06F01,	3		TAPE LIFT	LD-85
B07F01,	3		TAPE LIFT	LD-56
B07F01,	3		TAPE LIFT	LD-66
B11F01,	2		TAPE LIFT	LD-42
B11F02,	2		TAPE LIFT	LD-41

C03T01,	1		AL	LD-271
C03T01,	2		AL	LD-273
C03T01,	3		AL	LD-273
C03T01,	4		AL	LD-274
C03T01,	5		AL	LD-275
C03T01,	6		AL	LD-276
C03T01,	7		AL	LD-272
C05F01,	1		TAPE LIFT	LD-60
C09F01,	11		TAPE LIFT	LD-82
C09T01,	2	1	AL	LD-279
C09T01,	3	1	AL	LD-280
C09T01,	4	1	AL	LD-278
C09T01,	5	1	AL	LD-278
C09T01,	6	1	AL	LD-277
C09T01,	9	1	AL	LD-277
C09T01,	14	1	AL	LD-281
C09T01,	16	1	AL	LD-281
C09T01,	19	1	AL	LD-282
C09T01,	22	1	AL	LD-282
C09T01,	23	1	AL	LD-282
C09T01,	25	1	AL	LD-282
C10F01,	1		TAPE LIFT	LD-77
C10F01,	3		TAPE LIFT	LD-78
C11F01,	3		TAPE LIFT	LD-43
D05E00,	15		CU FOIL	LD-32
D05E01,	15		AL GROUND STRAP	LD-87
D06F02,	2		TAPE LIFT	LD-68
D08F02,	4		TAPE LIFT	LD-58
D08F02,	8		TAPE LIFT	LD-59
D10E01,	1		AL-MYLAR FOIL	LD-22
D10E01,	2		AL-MYLAR FOIL	LD-22
D10E01,	3	1	AL-MYLAR FOIL	LD-17
D10E01,	3	2	AL-MYLAR FOIL	LD-18
D12F01,	3		TAPE LIFT	LD-44
D12F01,	6		TAPE LIFT	LD-45
E01E00,	182	1	TEFLON	LD-173
E05F01,	1		TAPE LIFT	LD-69
E05F02,	1		TAPE LIFT	LD-70
E06F01,	1		TAPE LIFT	LD-62
E08F01,	1		TAPE LIFT	LD-53
E08F01,	4		TAPE LIFT	LD-54
E08F01,	5		TAPE LIFT	LD-55
E08F02,	1		TAPE LIFT	LD-52
E09F02,	6		TAPE LIFT	LD-83
E10E00,	81	1	TEFLON	LD-192
E10E00,	85	1	TEFLON	LD-185
E10E00,	86	1	TEFLON	LD-214
E10E00,	88	1	TEFLON	LD-140
E10E00,	89	1	TEFLON	LD-212
E10E00,	91	1	TEFLON	LD-147
E10E00,	92	1	TEFLON	LD-155
E10E00,	93	1	TEFLON	LD-148

E10E00,	94	1	TEFLON	LD-204
E10E00,	95	1	TEFLON	LD-205
E10E00,	108	1	TEFLON	LD-171
E10E00,	109	1	TEFLON	LD-171
E10E00,	110	1	TEFLON	LD-169
E10E00,	113	1	TEFLON	LD-166
E10E00,	115	1	TEFLON	LD-157
E10E00,	117	1	TEFLON	LD-178
E10E00,	146	1	TEFLON	LD-158
E10E00,	149	1	TEFLON	LD-169
E10E00,	154	1	TEFLON	LD-159
E10E00,	156	1	TEFLON	LD-169
E10E00,	158	1	TEFLON	LD-168
E10E00,	163	1	TEFLON	LD-163
E10E00,	164	1	TEFLON	LD-170
E10E00,	165	1	TEFLON	LD-166
E10E00,	168	1	TEFLON	LD-160
E10E00,	174	1	TEFLON	LD-167
E10E00,	175	1	TEFLON	LD-166
E10E00,	177	1	TEFLON	LD-172
E10E00,	178	1	TEFLON	LD-161
E10E00,	179	1	TEFLON	LD-161
E10E00,	180	1	TEFLON	LD-162
E10E00,	181	1	TEFLON	LD-176
E10E00,	183	1	TEFLON	LD-174
E10E00,	184	1	TEFLON	LD-175
E10E00,	185	1	TEFLON	LD-177
E10E00,	186	1	TEFLON	LD-182
E10E00,	187	1	TEFLON	LD-181
E10E00,	188	1	TEFLON	LD-183
E10E00,	189	1	TEFLON	LD-184
E10E00,	190	1	TEFLON	LD-179
E10E00,	191	1	TEFLON	LD-180
E10E00,	192	1	TEFLON	LD-180
E10E00,	194	1	TEFLON	LD-209
E10E00,	195	1	TEFLON	LD-184
E10E00,	198	1	TEFLON	LD-210
E10E00,	199	1	TEFLON	LD-208
E10E00,	200	1	TEFLON	LD-211
E10E00,	203	1	TEFLON	LD-208
E10E00,	204	1	TEFLON	LD-208
E10E00,	208	1	TEFLON	LD-213
E10E00,	209	1	TEFLON	LD-213
E10E00,	210	1	TEFLON	LD-215
E10E00,	214	1	TEFLON	LD-193
E10E00,	215	1	TEFLON	LD-202
E10E00,	217	1	TEFLON	LD-207
E10E00,	218	1	TEFLON	LD-207
E10E00,	219	1	TEFLON	LD-207
E10E00,	222	1	TEFLON	LD-202
E10E00,	224	1	TEFLON	LD-195

E10E00,	225	1	TEFLON	LD-195
E10E00,	227	1	TEFLON	LD-194
E10E00,	228	1	TEFLON	LD-195
E10E00,	229	1	TEFLON	LD-195
E10E00,	230	1	TEFLON	LD-196
E10E00,	231	1	TEFLON	LD-201
E10E00,	232	1	TEFLON	LD-201
E10E00,	233	1	TEFLON	LD-201
E10E00,	234	1	TEFLON	LD-190
E10E00,	236	1	TEFLON	LD-197
E10E00,	238	1	TEFLON	LD-203
E10E00,	239	1	TEFLON	LD-206
E10E00,	240	1	TEFLON	LD-203
E10E00,	241	1	TEFLON	LD-203
E10E00,	242	1	TEFLON	LD-191
E10E00,	246	1	TEFLON	LD-198
E10E00,	249	1	TEFLON	LD-199
E10E00,	250	1	TEFLON	LD-200
E10E00,	252	1	TEFLON	LD-189
E10E00,	254	1	TEFLON	LD-199
E10E00,	256	1	TEFLON	LD-204
E10E00,	265	1	TEFLON	LD-186
E10E00,	266	1	TEFLON	LD-186
E10E00,	267	1	TEFLON	LD-188
E10E00,	269	1	TEFLON	LD-187
E10E00,	270	1	TEFLON	LD-187
E10E00,	271	1	TEFLON	LD-186
E10E00,	272	1	TEFLON	LD-127
E10E00,	274	1	TEFLON	LD-127
E10E00,	274	1	TEFLON	LD-128
E10E00,	276	1	TEFLON	LD-142
E10E00,	277	1	TEFLON	LD-130
E10E00,	280	1	TEFLON	LD-128
E10E00,	281	1	TEFLON	LD-129
E10E00,	283	1	TEFLON	LD-143
E10E00,	284	1	TEFLON	LD-131
E10E00,	285	1	TEFLON	LD-143
E10E00,	286	1	TEFLON	LD-144
E10E00,	288	1	TEFLON	LD-156
E10E00,	289	1	TEFLON	LD-132
E10E00,	290	1	TEFLON	LD-145
E10E00,	294	1	TEFLON	LD-141
E10E00,	295	1	TEFLON	LD-141
E10E00,	296	1	TEFLON	LD-149
E10E00,	297	1	TEFLON	LD-141
E10E00,	298	1	TEFLON	LD-139
E10E00,	299	1	TEFLON	LD-133
E10E00,	300	1	TEFLON	LD-150
E10E00,	301	1	TEFLON	LD-153
E10E00,	303	1	TEFLON	LD-138
E10E00,	305	1	TEFLON	LD-134

E10E00.	306	1	TEFLON	LD-152
E10E00.	307	1	TEFLON	LD-150
E10E00.	308	1	TEFLON	LD-151
E10E00.	309	1	TEFLON	LD-154
E10E00.	311	1	TEFLON	LD-140
E10E00.	312	1	TEFLON	LD-138
E10E00.	313	1	TEFLON	LD-134
E10E00.	316	1	TEFLON	LD-146
E10E00.	318	1	TEFLON	LD-135
E10E00.	319	1	TEFLON	LD-135
E10E00.	320	1	TEFLON	LD-146
E10E00.	321	1	TEFLON	LD-137
E10E00.	322	1	TEFLON	LD-136
E10E00.	323	1	TEFLON	LD-135
E10F01.	4		TAPE LIFT	LD-73
E10F02.	2		TAPE LIFT	LD-72
E10F02.	8		TAPE LIFT	LD-79
E12E00.	4		WHITE-PAINTD AL	LD-5
E12E00.	5		WHITE-PAINTD AL	LD-6
E12E00.	6		WHITE-PAINTD AL	LD-7
E12E00.	7		BLK ANODIZED AL	LD-8
E12E00.	8		WHITE-PAINTD AL	LD-4
E12E00.	16		WHITE-PAINTD AL	LD-3
E12F01.	2		TAPE LIFT	LD-51
E12S01.	8		SCREW	LD-2
F01F01.	2		TAPE LIFT	LD-64
F02E00.	49	1	TEFLON BLANKET	LD-126
F05F01.	4		TAPE LIFT	LD-71
F07F02.	2		TAPE LIFT	LD-63
F07F03.	2		TAPE LIFT	LD-67
F08F03.	5		TAPE LIFT	LD-80
F09E00.	31		AL TAPE	LD-33
F09E00.	31		STEEL BOLT	LD-35
F09E01.	7		AL-MYLAR FOIL	LD-27
F09E01.	16	2	AL-MYLAR FOIL	LD-29
F09E01.	16	3	AL-MYLAR FOIL	LD-30
F09E05.	19		MULTI-BLANKET	LD-31
F09E08.	1		MULTI-BLANKET	LD-36
F09E08.	2		MULTI-BLANKET	LD-37
F09E08.	14		MULTI-BLANKET	LD-38
F09E08.	24		MULTI-BLANKET	LD-39
F09E08.	27		MULTI-BLANKET	LD-39
F10F01.	3		TAPE LIFT	LD-74
F12E01.	15		AL-MYLAR FOIL	LD-19
F12E01.	17		AL-MYLAR FOIL	LD-20
F12E02.	1	1	AL FOIL	LD-15
F12E02.	2	1	AL-MYLAR FOIL	LD-25
F12E02.	3	1	AL-MYLAR FOIL	LD-26
F12E02.	4		AL-MYLAR FOIL	LD-24
F12E02.	5		AL-MYLAR FOIL	LD-23
F12E03.	1		AL TAPE	LD-16

F12E03,	2		AL TAPE	LD-16
G25F01,	1		TAPE LIFT	LD-48
H03E00,	13	5	LEXAN SHEET	LD-101
H03E00,	13	4	LEXAN SHEET	LD-100
H03E00,	13	3	LEXAN SHEET	LD-99
H03E00,	13	2	LEXAN SHEET	LD-98
H03E00,	14	2	LEXAN SHEET	LD-95
H03E00,	14	4	LEXAN SHEET	LD-97
H03E00,	14	3	LEXAN SHEET	LD-96
H03E00,	15	2	LEXAN SHEET	LD-88
H03E00,	15	3	LEXAN SHEET	LD-89
H03E00,	15	4	LEXAN SHEET	LD-90
H03E00,	15	5	LEXAN SHEET	LD-91
H03E00,	15	8	LEXAN SHEET	LD-94
H03E00,	15	7	LEXAN SHEET	LD-93
H03E00,	15	6	LEXAN SHEET	LD-92
H05F02,	2		TAPE LIFT	LD-50
H07F03,	1		TAPE LIFT	LD-49
H09E00,	3		WHITE-PAINTD AL	LD-10
H09E00,	7		WHITE-PAINTD AL	LD-11
H09E00,	8		WHITE-PAINTD AL	LD-12
H09E00,	9		WHITE-PAINTD AL	LD-13
H09E00,	A		WHITE PAINTD AL	LD-14
H09E00,	10		WHITE-PAINTD AL	LD-9
H12E00,	1	3	LEXAN SHEET	LD-103
H12E00,	1	2	LEXAN SHEET	LD-102
H12E00,	1	12	LEXAN SHEET	LD-112
H12E00,	1	11	LEXAN SHEET	LD-111
H12E00,	1	10	LEXAN SHEET	LD-110
H12E00,	1	6	LEXAN SHEET	LD-106
H12E00,	1	9	LEXAN SHEET	LD-109
H12E00,	1	8	LEXAN SHEET	LD-108
H12E00,	1	5	LEXAN SHEET	LD-105
H12E00,	1	7	LEXAN SHEET	LD-107
H12E00,	1	4	LEXAN SHEET	LD-104
H12E00,	8		AL OVER SCREW	LD-21

Itemized List of Available LDEF Samples - Primary Surfaces

Surface	Component	Material
A01C01	CLAMP	ALUMINUM
A01C03	CLAMP	ALUMINUM
A01C08	CLAMP	ALUMINUM
A01E00A	EXPERIMENT TRAY	ALUMINUM
A01E00B	EXPERIMENT TRAY	ALUMINUM
A01E00C	EXPERIMENT TRAY	ALUMINUM
A01E00D	EXPERIMENT TRAY	ALUMINUM
A01E00E	EXPERIMENT TRAY	ALUMINUM
A01E00F	EXPERIMENT TRAY	ALUMINUM
A01E00G	EXPERIMENT TRAY	ALUMINUM
A01E00H	EXPERIMENT TRAY	ALUMINUM
A01E00I	EXPERIMENT TRAY	ALUMINUM
A01E00J	EXPERIMENT TRAY	ALUMINUM
A01E00K	EXPERIMENT TRAY	ALUMINUM
A01E00L	EXPERIMENT TRAY	ALUMINUM
A01E00M	EXPERIMENT TRAY	ALUMINUM
A01E00N	EXPERIMENT TRAY	ALUMINUM
A01E00O	EXPERIMENT TRAY	ALUMINUM
A01E00P	EXPERIMENT TRAY	ALUMINUM
A01E00Q	EXPERIMENT TRAY	ALUMINUM
A01E00R	EXPERIMENT TRAY	ALUMINUM
A01E00S	EXPERIMENT TRAY	ALUMINUM
A01F02A	FRAME	ALUMINUM
A01F02B	FRAME	ALUMINUM
A01S01B	BOLT	STEEL
A01S01E	BOLT	STEEL
A01S01F	BOLT	STEEL
A01S01G	BOLT	STEEL
A01S01J	BOLT	STEEL
A01S01L	BOLT	STEEL
A01S01N	BOLT	STEEL
A01S01O	BOLT	STEEL
A01S01P	BOLT	STEEL
A01S01Q	BOLT	STEEL
A01S01R	BOLT	STEEL
A01S01S	BOLT	STEEL
A01S02E	BOLT	STEEL
A01S02F	BOLT	STEEL
A01S02G	BOLT	STEEL
A01S02I	BOLT	STEEL
A01S02J	BOLT	STEEL
A01S02L	BOLT	STEEL

A01S02N	BOLT	STEEL
A01S02O	BOLT	STEEL
A01S02P	BOLT	STEEL
A01S02Q	BOLT	STEEL
A01S02S	BOLT	STEEL
A01S03E	BOLT	STEEL
A01S03F	BOLT	STEEL
A01S03G	BOLT	STEEL
A01S03I	BOLT	STEEL
A01S03J	BOLT	STEEL
A01S03N	BOLT	STEEL
A01S03O	BOLT	STEEL
A01S03P	BOLT	STEEL
A01S03Q	BOLT	STEEL
A01S03S	BOLT	STEEL
A01S04E	BOLT	STEEL
A01S04F	BOLT	STEEL
A01S04G	BOLT	STEEL
A01S04Q	BOLT	STEEL
A02C01	CLAMP	ALUMINUM
A02C03	CLAMP	ALUMINUM
A02E00AA	EXPERIMENT TRAY	TEFLON
A02E00AB	EXPERIMENT TRAY	TEFLON
A02F02	FRAME	ALUMINUM
A02S07C	BOLT	STEEL
A02S08C	BOLT	STEEL
A03C01	CLAMP	ALUMINUM
A03E00	EXPERIMENT TRAY	GOLD
A03E00A	EXPERIMENT TRAY	ALUMINUM
A03E00B	EXPERIMENT TRAY	ALUMINUM
A03E00C	EXPERIMENT TRAY	ALUMINUM
A03E00D	EXPERIMENT TRAY	ALUMINUM
A03E00E	EXPERIMENT TRAY	GOLD
A03E00F	EXPERIMENT TRAY	GOLD
A03E00G	EXPERIMENT TRAY	GOLD
A03E00H	EXPERIMENT TRAY	GOLD
A03E00I	EXPERIMENT TRAY	GOLD
A03E00J	EXPERIMENT TRAY	GOLD
A03E00K	EXPERIMENT TRAY	GOLD
A03E00L	EXPERIMENT TRAY	ALUMINUM
A03E00M	EXPERIMENT TRAY	ALUMINUM
A03E00N	EXPERIMENT TRAY	ALUMINUM
A03E00O	EXPERIMENT TRAY	ALUMINUM
A03E00P	EXPERIMENT TRAY	ALUMINUM
A03E00Q	EXPERIMENT TRAY	ALUMINUM
A03E00R	EXPERIMENT TRAY	ALUMINUM
A03E00S	EXPERIMENT TRAY	ALUMINUM
A03E00T	EXPERIMENT TRAY	ALUMINUM
A03E00U	EXPERIMENT TRAY	STEEL
A03E00V	EXPERIMENT TRAY	STEEL
A03E00W	EXPERIMENT TRAY	STEEL

A03E00X	EXPERIMENT TRAY	STEEL
A03E00Y	EXPERIMENT TRAY	ALUMINUM
A03E00Z	EXPERIMENT TRAY	ALUMINUM
A03E00ZA	EXPERIMENT TRAY	ALUMINUM
A03E00ZB	EXPERIMENT TRAY	ALUMINUM
A03E00ZC	EXPERIMENT TRAY	ALUMINUM
A03E00ZD	EXPERIMENT TRAY	ALUMINUM
A03E00ZE	EXPERIMENT TRAY	ALUMINUM
A03E00ZF	EXPERIMENT TRAY	ALUMINUM
A03E00ZG	EXPERIMENT TRAY	ALUMINUM
A03E00ZH	EXPERIMENT TRAY	ALUMINUM
A03E00ZI	EXPERIMENT TRAY	ALUMINUM
A03E00ZJ	EXPERIMENT TRAY	ALUMINUM
A03E00ZK	EXPERIMENT TRAY	ALUMINUM
A03E00ZL	EXPERIMENT TRAY	ALUMINUM
A03E00ZM	EXPERIMENT TRAY	ALUMINUM
A03E00ZN	EXPERIMENT TRAY	ALUMINUM
A03E00ZO	EXPERIMENT TRAY	ALUMINUM
A03E00ZP	EXPERIMENT TRAY	ALUMINUM
A03E00ZQ	EXPERIMENT TRAY	ALUMINUM
A03F02	FRAME	ALUMINUM
A03S03B	BOLT	STEEL
A03S07B	BOLT	STEEL
A03S07C	BOLT	STEEL
A04C05	CLAMP	ALUMINUM
A04C06	CLAMP	ALUMINUM
A04E00AA	EXPERIMENT TRAY	TEFLON
A04E00AB	EXPERIMENT TRAY	TEFLON
A04F02	FRAME	ALUMINUM
A05C03	CLAMP	ALUMINUM
A05C06	CLAMP	ALUMINUM
A05C07	CLAMP	ALUMINUM
A05C08	CLAMP	ALUMINUM
A05F02A	FRAME	ALUMINUM
A05F02B	FRAME	ALUMINUM
A05F02C	FRAME	ALUMINUM
A06C04	CLAMP	ALUMINUM
A06C05	CLAMP	ALUMINUM
A06C06	CLAMP	ALUMINUM
A07C01	CLAMP	ALUMINUM
A07C06	CLAMP	ALUMINUM
A07E00A	EXPERIMENT TRAY	ALUMINUM
A07E00B	EXPERIMENT TRAY	ALUMINUM
A07E00C	EXPERIMENT TRAY	ALUMINUM
A07E00D	EXPERIMENT TRAY	ALUMINUM
A07E00E	EXPERIMENT TRAY	ALUMINUM
A07E00F	EXPERIMENT TRAY	ALUMINUM
A07E00G	EXPERIMENT TRAY	ALUMINUM
A07E00H	EXPERIMENT TRAY	ALUMINUM
A07E00I	EXPERIMENT TRAY	ALUMINUM
A07F02A	FRAME	ALUMINUM

A07F02B	FRAME	ALUMINUM
A07F02C	FRAME	ALUMINUM
A08C07	CLAMP	ALUMINUM
A08C08	CLAMP	ALUMINUM
A08F02A	FRAME	ALUMINUM
A08F02B	FRAME	ALUMINUM
A08F02C	FRAME	ALUMINUM
A08F02D	FRAME	ALUMINUM
A08F02E	FRAME	ALUMINUM
A08F02F	FRAME	ALUMINUM
A08F02G	FRAME	ALUMINUM
A08F02H	FRAME	ALUMINUM
A08F02I	FRAME	ALUMINUM
A08F02J	FRAME	ALUMINUM
A09C02	CLAMP	ALUMINUM
A09C05	CLAMP	ALUMINUM
A09E00	EXPERIMENT TRAY	PAINTED AL
A09E01	EXPERIMENT TRAY	POLISHED ALUM
A09F02A	FRAME	ALUMINUM
A09F02B	FRAME	ALUMINUM
A09F02C	FRAME	ALUMINUM
A10C02	CLAMP	ALUMINUM
A10C06	CLAMP	ALUMINUM
A10C08	CLAMP	ALUMINUM
A10E00AA	EXPERIMENT TRAY	TEFLON
A10E00AB	EXPERIMENT TRAY	TEFLON
A10F02A	FRAME	ALUMINUM
A10F02B	FRAME	ALUMINUM
A10F02C	FRAME	ALUMINUM
A10F02D	FRAME	ALUMINUM
A10F02E	FRAME	ALUMINUM
A10F02F	FRAME	ALUMINUM
A10H06	SHIM	ALUMINUM
A10S05B	BOLT	STEEL
A11C01	CLAMP	ALUMINUM
A11C05	CLAMP	ALUMINUM
A11C07	CLAMP	ALUMINUM
A11E00A	EXPERIMENT TRAY	ALUMINUM
A11E00B	EXPERIMENT TRAY	ALUMINUM
A11E00C	EXPERIMENT TRAY	ALUMINUM
A11E00D	EXPERIMENT TRAY	ALUMINUM
A11E00E	EXPERIMENT TRAY	ALUMINUM
A11E00F	EXPERIMENT TRAY	ALUMINUM
A11E00G	EXPERIMENT TRAY	ALUMINUM
A11E00H	EXPERIMENT TRAY	ALUMINUM
A11E03	EXPERIMENT TRAY	ALUMINUM
A11E04	EXPERIMENT TRAY	ALUMINUM
A11E05	EXPERIMENT TRAY	ALUMINUM
A11E06	EXPERIMENT TRAY	ALUMINUM
A11F02A	FRAME	ALUMINUM
A11F02B	FRAME	ALUMINUM

A11F02C	FRAME	ALUMINUM
A11F02D	FRAME	ALUMINUM
A11F02E	FRAME	ALUMINUM
A11S01A	BOLT	STEEL
A11S02A	BOLT	STEEL
A12C02	CLAMP	ALUMINUM
B01C03	CLAMP	ALUMINUM
B01C06	CLAMP	ALUMINUM
B01F02A	FRAME	ALUMINUM
B01F02B	FRAME	ALUMINUM
B01F02C	FRAME	ALUMINUM
B01F02D	FRAME	ALUMINUM
B01F02E	FRAME	ALUMINUM
B01F02F	FRAME	ALUMINUM
B01F02G	FRAME	ALUMINUM
B01S05A	BOLT	STEEL
B01S08C	BOLT	STEEL
B02F02	FRAME	ALUMINUM
B03F02A	FRAME	ALUMINUM
B03F02B	FRAME	ALUMINUM
B03F02C	FRAME	ALUMINUM
B03F02D	FRAME	ALUMINUM
B03F02E	FRAME	ALUMINUM
B03F02F	FRAME	ALUMINUM
B03F02G	FRAME	ALUMINUM
B03F02H	FRAME	ALUMINUM
B03F02I	FRAME	ALUMINUM
B03F02J	FRAME	ALUMINUM
B03F02K	FRAME	ALUMINUM
B03F02L	FRAME	ALUMINUM
B03F02M	FRAME	ALUMINUM
B03F02N	FRAME	ALUMINUM
B03F02O	FRAME	ALUMINUM
B03F02P	FRAME	ALUMINUM
B03F02Q	FRAME	ALUMINUM
B03F02R	FRAME	ALUMINUM
B03F02S	FRAME	ALUMINUM
B03F02Z	FRAME	ALUMINUM
B04F02	FRAME	ALUMINUM
B05E00AA	EXPERIMENT TRAY	TEFLON
B05E00AB	EXPERIMENT TRAY	TEFLON
B05F02A	FRAME	ALUMINUM
B05F02B	FRAME	ALUMINUM
B05F02C	FRAME	ALUMINUM
B05F02D	FRAME	ALUMINUM
B05F02E	FRAME	ALUMINUM
B05F02F	FRAME	ALUMINUM
B05F02G	FRAME	ALUMINUM
B05F02H	FRAME	ALUMINUM
B05F02I	FRAME	ALUMINUM
B05F02J	FRAME	ALUMINUM

B05F02K	FRAME	ALUMINUM
B05F02L	FRAME	ALUMINUM
B05F02M	FRAME	ALUMINUM
B05F02N	FRAME	ALUMINUM
B05F02O	FRAME	ALUMINUM
B05F02P	FRAME	ALUMINUM
B05F02Q	FRAME	ALUMINUM
B05F02R	FRAME	ALUMINUM
B05F02S	FRAME	ALUMINUM
B05F02Z	FRAME	ALUMINUM
B06F02A	FRAME	ALUMINUM
B06F02B	FRAME	ALUMINUM
B06F02C	FRAME	ALUMINUM
B06H07	SHIM	ALUMINUM
B06S07A	BOLT	STEEL
B07E00AA	EXPERIMENT TRAY	TEFLON
B07E00AB	EXPERIMENT TRAY	TEFLON
B07F02A	FRAME	ALUMINUM
B07F02B	FRAME	ALUMINUM
B07F02C	FRAME	ALUMINUM
B07F02D	FRAME	ALUMINUM
B07F02E	FRAME	ALUMINUM
B07F02F	FRAME	ALUMINUM
B07F02G	FRAME	ALUMINUM
B07F02H	FRAME	ALUMINUM
B07F02I	FRAME	ALUMINUM
B07F02J	FRAME	ALUMINUM
B07F02K	FRAME	ALUMINUM
B07F02L	FRAME	ALUMINUM
B07F02M	FRAME	ALUMINUM
B07F02N	FRAME	ALUMINUM
B07F02O	FRAME	ALUMINUM
B07F02P	FRAME	ALUMINUM
B07F02Q	FRAME	ALUMINUM
B07F02R	FRAME	ALUMINUM
B07F02S	FRAME	ALUMINUM
B07F02Z	FRAME	ALUMINUM
B08E00B	EXPERIMENT TRAY	AL & PAINTED AL
B08F02A	FRAME	ALUMINUM
B08F02B	FRAME	ALUMINUM
B08F02C	FRAME	ALUMINUM
B08F02D	FRAME	ALUMINUM
B08F02E	FRAME	ALUMINUM
B08F02F	FRAME	ALUMINUM
B08F02G	FRAME	ALUMINUM
B08F02H	FRAME	ALUMINUM
B08F02I	FRAME	ALUMINUM
B08F02J	FRAME	ALUMINUM
B08F02K	FRAME	ALUMINUM
B08F02L	FRAME	ALUMINUM
B08F02M	FRAME	ALUMINUM

B08F02N	FRAME	ALUMINUM
B08F02O	FRAME	ALUMINUM
B08F02P	FRAME	ALUMINUM
B08F02Q	FRAME	ALUMINUM
B08F02R	FRAME	ALUMINUM
B08F02S	FRAME	ALUMINUM
B08F02Z	FRAME	ALUMINUM
B08H04	SHIM	ALUMINUM
B08S01	BOLT	STEEL
B08S02	BOLT	STEEL
B08S03	BOLT	STEEL
B08S04	BOLT	STEEL
B08S05	BOLT	STEEL
B08S06	BOLT	STEEL
B08S07	BOLT	STEEL
B08S08	BOLT	STEEL
B08S09	BOLT	STEEL
B09F02A	FRAME	ALUMINUM
B09F02B	FRAME	ALUMINUM
B09F02C	FRAME	ALUMINUM
B09F02D	FRAME	ALUMINUM
B09F02E	FRAME	ALUMINUM
B09F02F	FRAME	ALUMINUM
B09F02G	FRAME	ALUMINUM
B09F02H	FRAME	ALUMINUM
B09F02I	FRAME	ALUMINUM
B09F02J	FRAME	ALUMINUM
B09F02K	FRAME	ALUMINUM
B09F02L	FRAME	ALUMINUM
B09F02M	FRAME	ALUMINUM
B09F02N	FRAME	ALUMINUM
B09F02O	FRAME	ALUMINUM
B09F02P	FRAME	ALUMINUM
B09F02Q	FRAME	ALUMINUM
B09F02R	FRAME	ALUMINUM
B09F02S	FRAME	ALUMINUM
B09F02Z	FRAME	ALUMINUM
B09H08	SHIM	ALUMINUM
B09S01C	BOLT	STEEL
B09S03A	BOLT	STEEL
B09S04C	BOLT	STEEL
B10F02A	FRAME	ALUMINUM
B10F02B	FRAME	ALUMINUM
B10F02C	FRAME	ALUMINUM
B10F02D	FRAME	ALUMINUM
B10F02E	FRAME	ALUMINUM
B10F02F	FRAME	ALUMINUM
B10F02G	FRAME	ALUMINUM
B10F02H	FRAME	ALUMINUM
B10F02I	FRAME	ALUMINUM
B10F02J	FRAME	ALUMINUM

B10S03C	BOLT	STEEL
B10S04A	BOLT	STEEL
B10S04C	BOLT	STEEL
B10S06B	BOLT	STEEL
B10S08B	BOLT	STEEL
B11F02A	FRAME	ALUMINUM
B11F02B	FRAME	ALUMINUM
B11F02C	FRAME	ALUMINUM
B11F02D	FRAME	ALUMINUM
B11F02E	FRAME	ALUMINUM
B11F02F	FRAME	ALUMINUM
B11F02G	FRAME	ALUMINUM
B11S01A	BOLT	STEEL
B11S07A	BOLT	STEEL
B12C01	CLAMP	ALUMINUM
B12E01	EXPERIMENT TRAY	MOS DETECTOR
B12F02A	FRAME	ALUMINUM
B12F02B	FRAME	ALUMINUM
B12F02C	FRAME	ALUMINUM
B12F02D	FRAME	ALUMINUM
B12F02E	FRAME	ALUMINUM
B12F02F	FRAME	ALUMINUM
B12F02G	FRAME	ALUMINUM
B12F02H	FRAME	ALUMINUM
B12F02I	FRAME	ALUMINUM
B12F02J	FRAME	ALUMINUM
B12F02K	FRAME	ALUMINUM
B12F02L	FRAME	ALUMINUM
B12F02M	FRAME	ALUMINUM
B12F02N	FRAME	ALUMINUM
B12F02O	FRAME	ALUMINUM
B12F02P	FRAME	ALUMINUM
B12F02Q	FRAME	ALUMINUM
B12F02R	FRAME	ALUMINUM
B12F02S	FRAME	ALUMINUM
B12F02Z	FRAME	ALUMINUM
B12S03B	BOLT	STEEL
C01C03	CLAMP	ALUMINUM
C01C06	CLAMP	ALUMINUM
C01C08	CLAMP	ALUMINUM
C01F02A	FRAME	ALUMINUM
C01F02B	FRAME	ALUMINUM
C01F02C	FRAME	ALUMINUM
C01F02D	FRAME	ALUMINUM
C01F02E	FRAME	ALUMINUM
C01F02F	FRAME	ALUMINUM
C01F02G	FRAME	ALUMINUM
C01F02H	FRAME	ALUMINUM
C01F02I	FRAME	ALUMINUM
C01F02J	FRAME	ALUMINUM
C01F02K	FRAME	ALUMINUM

C01F02L	FRAME	ALUMINUM
C01F02M	FRAME	ALUMINUM
C01F02N	FRAME	ALUMINUM
C01F02O	FRAME	ALUMINUM
C01F02P	FRAME	ALUMINUM
C01F02Q	FRAME	ALUMINUM
C01F02R	FRAME	ALUMINUM
C01F02S	FRAME	ALUMINUM
C01F02Z	FRAME	ALUMINUM
C02C03	CLAMP	ALUMINUM
C02C04	CLAMP	ALUMINUM
C02C05	CLAMP	ALUMINUM
C02F02A	FRAME	ALUMINUM
C02F02B	FRAME	ALUMINUM
C02F02C	FRAME	ALUMINUM
C02F02D	FRAME	ALUMINUM
C02F02E	FRAME	ALUMINUM
C02F02F	FRAME	ALUMINUM
C02F02G	FRAME	ALUMINUM
C02F02H	FRAME	ALUMINUM
C02F02I	FRAME	ALUMINUM
C02F02J	FRAME	ALUMINUM
C02F02K	FRAME	ALUMINUM
C02F02L	FRAME	ALUMINUM
C02F02M	FRAME	ALUMINUM
C02F02N	FRAME	ALUMINUM
C02F02O	FRAME	ALUMINUM
C02F02P	FRAME	ALUMINUM
C02F02Q	FRAME	ALUMINUM
C02F02R	FRAME	ALUMINUM
C02F02S	FRAME	ALUMINUM
C02F02Z	FRAME	ALUMINUM
C03C01	CLAMP	ALUMINUM
C03C05	CLAMP	ALUMINUM
C03E01	EXPERIMENT TRAY	MOS DETECTOR
C03F02	FRAME	ALUMINUM
C04C06	CLAMP	ALUMINUM
C04F02A	FRAME	ALUMINUM
C04F02B	FRAME	ALUMINUM
C04F02C	FRAME	ALUMINUM
C04F02D	FRAME	ALUMINUM
C04F02E	FRAME	ALUMINUM
C04F02F	FRAME	ALUMINUM
C04F02G	FRAME	ALUMINUM
C04F02H	FRAME	ALUMINUM
C04F02I	FRAME	ALUMINUM
C04F02J	FRAME	ALUMINUM
C04F02K	FRAME	ALUMINUM
C04F02L	FRAME	ALUMINUM
C04F02M	FRAME	ALUMINUM
C04F02N	FRAME	ALUMINUM

C04F02O	FRAME	ALUMINUM
C04F02P	FRAME	ALUMINUM
C04F02Q	FRAME	ALUMINUM
C04F02R	FRAME	ALUMINUM
C04F02S	FRAME	ALUMINUM
C04F02Z	FRAME	ALUMINUM
C05C03	CLAMP	ALUMINUM
C05C07	CLAMP	ALUMINUM
C05C08	CLAMP	ALUMINUM
C05E00AA	EXPERIMENT TRAY	TEFLON
C05E00AB	EXPERIMENT TRAY	TEFLON
C05F02	FRAME	ALUMINUM
C05H07	SHIM	ALUMINUM
C06C04	CLAMP	ALUMINUM
C06C07	CLAMP	ALUMINUM
C06C08	CLAMP	ALUMINUM
C06E00AA	EXPERIMENT TRAY	TEFLON
C06E00AB	EXPERIMENT TRAY	TEFLON
C06F02	FRAME	ALUMINUM
C07C03	CLAMP	ALUMINUM
C07C05	CLAMP	ALUMINUM
C07F02A	FRAME	ALUMINUM
C07F02B	FRAME	ALUMINUM
C07F02C	FRAME	ALUMINUM
C07F02D	FRAME	ALUMINUM
C07F02E	FRAME	ALUMINUM
C07F02F	FRAME	ALUMINUM
C07F02G	FRAME	ALUMINUM
C07F02H	FRAME	ALUMINUM
C07F02I	FRAME	ALUMINUM
C07F02J	FRAME	ALUMINUM
C08C02	CLAMP	ALUMINUM
C08C03	CLAMP	ALUMINUM
C08C04	CLAMP	ALUMINUM
C08C06	CLAMP	ALUMINUM
C08E00AA	EXPERIMENT TRAY	TEFLON
C08E00AB	EXPERIMENT TRAY	TEFLON
C08F02	FRAME	ALUMINUM
C08S01A	BOLT	STEEL
C08S03B	BOLT	STEEL
C09C05	CLAMP	ALUMINUM
C09E01	EXPERIMENT TRAY	MOS DETECTOR
C09F02A	FRAME	ALUMINUM
C09F02B	FRAME	ALUMINUM
C09F02C	FRAME	ALUMINUM
C09F02D	FRAME	ALUMINUM
C09F02E	FRAME	ALUMINUM
C09F02F	FRAME	ALUMINUM
C09F02G	FRAME	ALUMINUM
C09F02H	FRAME	ALUMINUM
C09F02I	FRAME	ALUMINUM

C09F02J	FRAME	ALUMINUM
C09F02K	FRAME	ALUMINUM
C09F02L	FRAME	ALUMINUM
C09F02M	FRAME	ALUMINUM
C09F02N	FRAME	ALUMINUM
C09F02O	FRAME	ALUMINUM
C09F02P	FRAME	ALUMINUM
C09F02Q	FRAME	ALUMINUM
C09F02R	FRAME	ALUMINUM
C09F02S	FRAME	ALUMINUM
C09F02Z	FRAME	ALUMINUM
C09H03	SHIM	ALUMINUM
C09S06A	BOLT	STEEL
C09S07B	BOLT	STEEL
C09S07C	BOLT	STEEL
C10C02	CLAMP	ALUMINUM
C10C05	CLAMP	ALUMINUM
C10C06	CLAMP	ALUMINUM
C10E00A	EXPERIMENT TRAY	TEFLON/NYLO
C10E00B	EXPERIMENT TRAY	ALUMINUM
C10E00C	EXPERIMENT TRAY	PAINTED AL
C10E00D	EXPERIMENT TRAY	ALUMINUM
C10E00E	EXPERIMENT TRAY	ALUMINUM
C10E00F	EXPERIMENT TRAY	ALUMINUM
C10E00G	EXPERIMENT TRAY	ALUMINUM
C10E00H	EXPERIMENT TRAY	ALUMINUM
C10E00I	EXPERIMENT TRAY	ALUMINUM
C10E00J	EXPERIMENT TRAY	ALUMINUM
C10E00K	EXPERIMENT TRAY	ALUMINUM
C10E00L	EXPERIMENT TRAY	ALUMINUM
C10E00M	EXPERIMENT TRAY	ALUMINUM
C10F02A	FRAME	ALUMINUM
C10F02B	FRAME	ALUMINUM
C10F02C	FRAME	ALUMINUM
C10F02D	FRAME	ALUMINUM
C10F02E	FRAME	ALUMINUM
C10F02F	FRAME	ALUMINUM
C10F02G	FRAME	ALUMINUM
C10F02H	FRAME	ALUMINUM
C10F02I	FRAME	ALUMINUM
C10F02J	FRAME	ALUMINUM
C10F02K	FRAME	ALUMINUM
C10F02L	FRAME	ALUMINUM
C10F02M	FRAME	ALUMINUM
C10F02N	FRAME	ALUMINUM
C10F02O	FRAME	ALUMINUM
C10F02P	FRAME	ALUMINUM
C10F02Q	FRAME	ALUMINUM
C10F02R	FRAME	ALUMINUM
C10F02S	FRAME	ALUMINUM
C10F02Z	FRAME	ALUMINUM

C10S01	BOLT	STEEL
C11C01	CLAMP	ALUMINUM
C11C02	CLAMP	ALUMINUM
C11C04	CLAMP	ALUMINUM
C11C08	CLAMP	ALUMINUM
C11E00AA	EXPERIMENT TRAY	TEFLON
C11E00AB	EXPERIMENT TRAY	TEFLON
C11F02A	FRAME	ALUMINUM
C11F02B	FRAME	ALUMINUM
C11F02C	FRAME	ALUMINUM
C11F02D	FRAME	ALUMINUM
C11F02E	FRAME	ALUMINUM
C11F02F	FRAME	ALUMINUM
C11F02G	FRAME	ALUMINUM
C11F02H	FRAME	ALUMINUM
C11F02I	FRAME	ALUMINUM
C11F02J	FRAME	ALUMINUM
C11F02K	FRAME	ALUMINUM
C11F02L	FRAME	ALUMINUM
C11F02M	FRAME	ALUMINUM
C11F02N	FRAME	ALUMINUM
C11F02O	FRAME	ALUMINUM
C11F02P	FRAME	ALUMINUM
C11F02Q	FRAME	ALUMINUM
C11F02R	FRAME	ALUMINUM
C11F02S	FRAME	ALUMINUM
C11F02Z	FRAME	ALUMINUM
C12C02	CLAMP	ALUMINUM
C12F02	FRAME	ALUMINUM
C12S02A	BOLT	STEEL
D01C05	CLAMP	ALUMINUM
D01C06	CLAMP	ALUMINUM
D01E00AA	EXPERIMENT TRAY	TEFLON
D01E00AB	EXPERIMENT TRAY	TEFLON
D02C02	CLAMP	ALUMINUM
D02E00A	EXPERIMENT TRAY	ALUMINUM
D03C04	CLAMP	ALUMINUM
D04C03	CLAMP	ALUMINUM
D04C05	CLAMP	ALUMINUM
D04C07	CLAMP	ALUMINUM
D05C08	CLAMP	ALUMINUM
D05E00AB	EXPERIMENT TRAY	TEFLON
D05E00AC	EXPERIMENT TRAY	TEFLON
D05S06B	BOLT	STEEL
D06C02	CLAMP	
D06C03	CLAMP	ALUMINUM
D06E01	EXPERIMENT TRAY	MOS DETECTOR
D06S04A	BOLT	STEEL
D06S04C	BOLT	STEEL
D06S06A	BOLT	STEEL
D07C03	CLAMP	ALUMINUM

D07C04	CLAMP	ALUMINUM
D07E00AB	EXPERIMENT TRAY	TEFLON
D07E00AC	EXPERIMENT TRAY	TEFLON
D07H06	SHIM	ALUMINUM
D08C01	CLAMP	ALUMINUM
D08C08	CLAMP	ALUMINUM
D08S06A	BOLT	STEEL
D09C03	CLAMP	ALUMINUM
D09S04A	BOLT	STEEL
D10C02	CLAMP	ALUMINUM
D10S03C	BOLT	STEEL
D10S05B	BOLT	STEEL
D11C02	CLAMP	ALUMINUM
D11C05	CLAMP	ALUMINUM
D11E00AA	EXPERIMENT TRAY	TEFLON
D11E00AB	EXPERIMENT TRAY	TEFLON
D11S01A	BOLT	STEEL
D12C01	CLAMP	ALUMINUM
D12C02	CLAMP	ALUMINUM
D12C05	CLAMP	ALUMINUM
DO6C02	CLAMP	ALUMINUM
E01C01	CLAMP	ALUMINUM
E01C02	CLAMP	ALUMINUM
E01C06	CLAMP	ALUMINUM
E01F02	FRAME	ALUMINUM
E01H01	SHIM	ALUMINUM
E01S01C	BOLT	STEEL
E02C01	CLAMP	ALUMINUM
E02C02	CLAMP	ALUMINUM
E02E00AA	EXPERIMENT TRAY	TEFLON
E02E00AB	EXPERIMENT TRAY	TEFLON
E02E00AC	EXPERIMENT TRAY	TEFLON
E02F02A	FRAME	ALUMINUM
E02F02B	FRAME	ALUMINUM
E02F02C	FRAME	ALUMINUM
E02F02D	FRAME	ALUMINUM
E02F02E	FRAME	ALUMINUM
E02F02F	FRAME	ALUMINUM
E02F02G	FRAME	ALUMINUM
E02F02H	FRAME	ALUMINUM
E02F02I	FRAME	ALUMINUM
E02F02J	FRAME	ALUMINUM
E02F02K	FRAME	ALUMINUM
E02F02L	FRAME	ALUMINUM
E02F02M	FRAME	ALUMINUM
E02F02N	FRAME	ALUMINUM
E02F02O	FRAME	ALUMINUM
E02F02P	FRAME	ALUMINUM
E02F02Q	FRAME	ALUMINUM
E02F02R	FRAME	ALUMINUM
E02F02S	FRAME	ALUMINUM

E02F02Z	FRAME	ALUMINUM
E03E01A	EXPERIMENT TRAY	
E03F02A	FRAME	ALUMINUM
E03F02B	FRAME	ALUMINUM
E03F02C	FRAME	ALUMINUM
E04C03	CLAMP	ALUMINUM
E04F02A	FRAME	ALUMINUM
E04F02B	FRAME	ALUMINUM
E04F02C	FRAME	ALUMINUM
E04F02D	FRAME	ALUMINUM
E04F02E	FRAME	ALUMINUM
E04F02F	FRAME	ALUMINUM
E04F02G	FRAME	ALUMINUM
E04F02H	FRAME	ALUMINUM
E04F02I	FRAME	ALUMINUM
E04F02J	FRAME	ALUMINUM
E04F02K	FRAME	ALUMINUM
E04F02L	FRAME	ALUMINUM
E04F02M	FRAME	ALUMINUM
E04F02N	FRAME	ALUMINUM
E04F02O	FRAME	ALUMINUM
E04F02P	FRAME	ALUMINUM
E04F02Q	FRAME	ALUMINUM
E04F02R	FRAME	ALUMINUM
E04F02S	FRAME	ALUMINUM
E04F02Z	FRAME	ALUMINUM
E05C03	CLAMP	ALUMINUM
E05C05	CLAMP	ALUMINUM
E05C07	CLAMP	ALUMINUM
E05F02	FRAME	ALUMINUM
E06C05	CLAMP	ALUMINUM
E06E00A	EXPERIMENT TRAY	AL-MYLAR BL
E06F02A	FRAME	ALUMINUM
E06F02B	FRAME	ALUMINUM
E06F02C	FRAME	ALUMINUM
E06F02D	FRAME	ALUMINUM
E06F02E	FRAME	ALUMINUM
E06F02F	FRAME	ALUMINUM
E06F02G	FRAME	ALUMINUM
E06F02H	FRAME	ALUMINUM
E06F02I	FRAME	ALUMINUM
E06F02J	FRAME	ALUMINUM
E06F02K	FRAME	ALUMINUM
E06F02L	FRAME	ALUMINUM
E06F02M	FRAME	ALUMINUM
E06F02N	FRAME	ALUMINUM
E06F02O	FRAME	ALUMINUM
E06F02P	FRAME	ALUMINUM
E06F02Q	FRAME	ALUMINUM
E06F02R	FRAME	ALUMINUM
E06F02S	FRAME	ALUMINUM

E06F02Z	FRAME	ALUMINUM
E06S08B	BOLT	STEEL
E07C02	CLAMP	ALUMINUM
E07C03	CLAMP	ALUMINUM
E07C05	CLAMP	ALUMINUM
E07C07	CLAMP	ALUMINUM
E07F02A	FRAME	ALUMINUM
E07F02B	FRAME	ALUMINUM
E07F02C	FRAME	ALUMINUM
E07F02D	FRAME	ALUMINUM
E07F02E	FRAME	ALUMINUM
E07F02F	FRAME	ALUMINUM
E07F02G	FRAME	ALUMINUM
E07F02H	FRAME	ALUMINUM
E07F02I	FRAME	ALUMINUM
E07F02J	FRAME	ALUMINUM
E07F02K	FRAME	ALUMINUM
E07F02L	FRAME	ALUMINUM
E07F02M	FRAME	ALUMINUM
E07F02N	FRAME	ALUMINUM
E07F02O	FRAME	ALUMINUM
E07F02P	FRAME	ALUMINUM
E07F02Q	FRAME	ALUMINUM
E07F02R	FRAME	ALUMINUM
E07F02S	FRAME	ALUMINUM
E07F02Z	FRAME	ALUMINUM
E07S04B	BOLT	STEEL
E08C02	CLAMP	ALUMINUM
E08C05	CLAMP	ALUMINUM
E08C07	CLAMP	ALUMINUM
E08F02	FRAME	ALUMINUM
E08S04A	BOLT	STEEL
E09C01	CLAMP	ALUMINUM
E09C07	CLAMP	ALUMINUM
E09E00A	EXPERIMENT TRAY	PAINTED AI
E09E00D	EXPERIMENT TRAY	PAINTED AI
E09F02A	FRAME	ALUMINUM
E09F02B	FRAME	ALUMINUM
E09F02C	FRAME	ALUMINUM
E09F02D	FRAME	ALUMINUM
E09F02E	FRAME	ALUMINUM
E09F02F	FRAME	ALUMINUM
E09F02G	FRAME	ALUMINUM
E09S05C	BOLT	STEEL
E09S07C	BOLT	STEEL
E10C05	CLAMP	ALUMINUM
E10C07	CLAMP	ALUMINUM
E10E00A	EXPERIMENT TRAY	TEFLON
E10E00AA	EXPERIMENT TRAY	TEFLON
E10E01	EXPERIMENT TRAY	AL GROUND S
E10F02A	FRAME	ALUMINUM

E10F02B	FRAME	ALUMINUM
E10F02C	FRAME	ALUMINUM
E10F02D	FRAME	ALUMINUM
E10F02E	FRAME	ALUMINUM
E10F02F	FRAME	ALUMINUM
E10S05C	BOLT	STEEL
E11C01	CLAMP	ALUMINUM
E11C02	CLAMP	ALUMINUM
E11C05	CLAMP	ALUMINUM
E11F02	FRAME	ALUMINUM
E11S02C	BOLT	STEEL
E12C01	CLAMP	ALUMINUM
E12C03	CLAMP	ALUMINUM
E12F02A	FRAME	ALUMINUM
E12F02B	FRAME	ALUMINUM
E12F02C	FRAME	ALUMINUM
E12F02D	FRAME	ALUMINUM
E12F02E	FRAME	ALUMINUM
E12F02F	FRAME	ALUMINUM
E12F02G	FRAME	ALUMINUM
E12F02H	FRAME	ALUMINUM
E12F02I	FRAME	ALUMINUM
E12F02J	FRAME	ALUMINUM
E12F02K	FRAME	ALUMINUM
E12F02L	FRAME	ALUMINUM
E12F02M	FRAME	ALUMINUM
E12F02N	FRAME	ALUMINUM
E12F02O	FRAME	ALUMINUM
E12F02P	FRAME	ALUMINUM
E12F02Q	FRAME	ALUMINUM
E12F02R	FRAME	ALUMINUM
E12F02S	FRAME	ALUMINUM
E12F02T	FRAME	ALUMINUM
E12F02U	FRAME	ALUMINUM
E12F02Z	FRAME	ALUMINUM
F01C01	CLAMP	ALUMINUM
F01C02	CLAMP	ALUMINUM
F01C04	CLAMP	ALUMINUM
F01C05	CLAMP	ALUMINUM
F01F02A	FRAME	ALUMINUM
F01F02B	FRAME	ALUMINUM
F01F02C	FRAME	ALUMINUM
F01F02D	FRAME	ALUMINUM
F01F02E	FRAME	ALUMINUM
F01F02F	FRAME	ALUMINUM
F01F02G	FRAME	ALUMINUM
F01F02H	FRAME	ALUMINUM
F01F02I	FRAME	ALUMINUM
F01F02J	FRAME	ALUMINUM
F01F02K	FRAME	ALUMINUM
F01F02L	FRAME	ALUMINUM

F01F02M	FRAME	ALUMINUM
F01F02N	FRAME	ALUMINUM
F01F02O	FRAME	ALUMINUM
F01F02P	FRAME	ALUMINUM
F01F02Q	FRAME	ALUMINUM
F01F02R	FRAME	ALUMINUM
F01F02S	FRAME	ALUMINUM
F01F02Z	FRAME	ALUMINUM
F01F03A	FRAME	ALUMINUM
F01F03B	FRAME	ALUMINUM
F01F03C	FRAME	ALUMINUM
F01F03D	FRAME	ALUMINUM
F01F03E	FRAME	ALUMINUM
F02C02	CLAMP	ALUMINUM
F02C03	CLAMP	ALUMINUM
F02C04	CLAMP	ALUMINUM
F02E00AA	EXPERIMENT TRAY	TEFLON
F02E00AB	EXPERIMENT TRAY	TEFLON
F02E00AC	EXPERIMENT TRAY	TEFLON
F02E00BA	EXPERIMENT TRAY	TEFLON
F02E00BB	EXPERIMENT TRAY	TEFLON
F02E00CA	EXPERIMENT TRAY	TEFLON
F02E00CB	EXPERIMENT TRAY	TEFLON
F02F02	FRAME	ALUMINUM
F02F03A	FRAME	ALUMINUM
F02F03B	FRAME	ALUMINUM
F02F03C	FRAME	ALUMINUM
F02F03D	FRAME	ALUMINUM
F02F03E	FRAME	ALUMINUM
F02F03F	FRAME	ALUMINUM
F02F03G	FRAME	ALUMINUM
F03C05	CLAMP	ALUMINUM
F03C08	CLAMP	ALUMINUM
F03F02A	FRAME	ALUMINUM
F03F02B	FRAME	ALUMINUM
F03F02C	FRAME	ALUMINUM
F03F02D	FRAME	ALUMINUM
F03F02E	FRAME	ALUMINUM
F03F02F	FRAME	ALUMINUM
F03F02G	FRAME	ALUMINUM
F03F02H	FRAME	ALUMINUM
F03F02I	FRAME	ALUMINUM
F03F02J	FRAME	ALUMINUM
F03F02K	FRAME	ALUMINUM
F03F02L	FRAME	ALUMINUM
F03F02M	FRAME	ALUMINUM
F03F02N	FRAME	ALUMINUM
F03F02O	FRAME	ALUMINUM
F03F02P	FRAME	ALUMINUM
F03F02Q	FRAME	ALUMINUM
F03F02R	FRAME	ALUMINUM

F03F02S	FRAME	ALUMINUM
F03F02Z	FRAME	ALUMINUM
F03F03A	FRAME	ALUMINUM
F03F03B	FRAME	ALUMINUM
F03F03C	FRAME	ALUMINUM
F04C04	CLAMP	ALUMINUM
F04C05	CLAMP	ALUMINUM
F04C08	CLAMP	ALUMINUM
F04E00AA	EXPERIMENT TRAY	TEFLON
F04E00AB	EXPERIMENT TRAY	TEFLON
F04F02A	FRAME	ALUMINUM
F04F02B	FRAME	ALUMINUM
F04F02C	FRAME	ALUMINUM
F04F02D	FRAME	ALUMINUM
F04F02E	FRAME	ALUMINUM
F04F02F	FRAME	ALUMINUM
F04F02G	FRAME	ALUMINUM
F04F02H	FRAME	ALUMINUM
F04F02I	FRAME	ALUMINUM
F04F03A	FRAME	ALUMINUM
F04F03B	FRAME	ALUMINUM
F04F03C	FRAME	ALUMINUM
F04H04	SHIM	ALUMINUM
F04H06	SHIM	ALUMINUM
F04S04B	BOLT	STEEL
F05C01	CLAMP	ALUMINUM
F05C05	CLAMP	ALUMINUM
F05C06	CLAMP	ALUMINUM
F05C07	CLAMP	ALUMINUM
F05F02A	FRAME	ALUMINUM
F05F02B	FRAME	ALUMINUM
F05F02C	FRAME	ALUMINUM
F05F02D	FRAME	ALUMINUM
F05F02E	FRAME	ALUMINUM
F05F02F	FRAME	ALUMINUM
F05F02G	FRAME	ALUMINUM
F05F02H	FRAME	ALUMINUM
F05F02I	FRAME	ALUMINUM
F05F02J	FRAME	ALUMINUM
F05F02K	FRAME	ALUMINUM
F05F02L	FRAME	ALUMINUM
F05F02M	FRAME	ALUMINUM
F05F02N	FRAME	ALUMINUM
F05F02O	FRAME	ALUMINUM
F05F02P	FRAME	ALUMINUM
F05F02Q	FRAME	ALUMINUM
F05F02R	FRAME	ALUMINUM
F05F02S	FRAME	ALUMINUM
F05F02Z	FRAME	ALUMINUM
F05F03A	FRAME	ALUMINUM
F05F03B	FRAME	ALUMINUM

F05F03C	FRAME	ALUMINUM
F05H07	SHIM	ALUMINUM
F05S01B	BOLT	STEEL
F05S01C	BOLT	STEEL
F05S03A	BOLT	STEEL
F05S05A	BOLT	STEEL
F05S07B	BOLT	STEEL
F06C05	CLAMP	ALUMINUM
F06C07	CLAMP	ALUMINUM
F06C08	CLAMP	ALUMINUM
F06F02A	FRAME	ALUMINUM
F06F02B	FRAME	ALUMINUM
F06F02C	FRAME	ALUMINUM
F06F02D	FRAME	ALUMINUM
F06F02E	FRAME	ALUMINUM
F06F02F	FRAME	ALUMINUM
F06F02G	FRAME	ALUMINUM
F06F02H	FRAME	ALUMINUM
F06F02I	FRAME	ALUMINUM
F06F02J	FRAME	ALUMINUM
F06F02K	FRAME	ALUMINUM
F06F02L	FRAME	ALUMINUM
F06F02M	FRAME	ALUMINUM
F06F02N	FRAME	ALUMINUM
F06F02O	FRAME	ALUMINUM
F06F02P	FRAME	ALUMINUM
F06F02Q	FRAME	ALUMINUM
F06F02R	FRAME	ALUMINUM
F06F02S	FRAME	ALUMINUM
F06F02Z	FRAME	ALUMINUM
F07C01	CLAMP	ALUMINUM
F07C04	CLAMP	ALUMINUM
F07C06	CLAMP	ALUMINUM
F07C08	CLAMP	ALUMINUM
F07F03A	FRAME	ALUMINUM
F07F03B	FRAME	ALUMINUM
F07F03C	FRAME	ALUMINUM
F07F03D	FRAME	ALUMINUM
F07F03E	FRAME	ALUMINUM
F07H01	SHIM	ALUMINUM
F08C01	CLAMP	ALUMINUM
F08C05	CLAMP	ALUMINUM
F08C07	CLAMP	ALUMINUM
F08C08	CLAMP	ALUMINUM
F08F02A	FRAME	ALUMINUM
F08F02B	FRAME	ALUMINUM
F08F02C	FRAME	ALUMINUM
F08F02D	FRAME	ALUMINUM
F08F02E	FRAME	ALUMINUM
F08F02F	FRAME	ALUMINUM
F08F02G	FRAME	ALUMINUM

F08F02H	FRAME	ALUMINUM
F08F02I	FRAME	ALUMINUM
F08F03A	FRAME	ALUMINUM
F08F03B	FRAME	ALUMINUM
F08F03C	FRAME	ALUMINUM
F08F03D	FRAME	ALUMINUM
F08F03E	FRAME	ALUMINUM
F08F03F	FRAME	ALUMINUM
F08F03G	FRAME	ALUMINUM
F08S04B	BOLT	STEEL
F09C02	CLAMP	ALUMINUM
F09C03	CLAMP	ALUMINUM
F09E01	EXPERIMENT TRAY	ALUMINUM
F09E02	EXPERIMENT TRAY	AL-MYLAR BL
F09E03	EXPERIMENT TRAY	AL-MYLAR BL
F09E04	EXPERIMENT TRAY	AL-MYLAR BL
F09E07	EXPERIMENT TRAY	AL-MYLAR BL
F09F02	FRAME	ALUMINUM
F09F03A	FRAME	ALUMINUM
F09F03B	FRAME	ALUMINUM
F09F03C	FRAME	ALUMINUM
F09F03D	FRAME	ALUMINUM
F09F03E	FRAME	ALUMINUM
F09F03F	FRAME	ALUMINUM
F09S02A	BOLT	STEEL
F09S04C	BOLT	STEEL
F10C03	CLAMP	ALUMINUM
F10C05	CLAMP	ALUMINUM
F10C06	CLAMP	ALUMINUM
F10C08	CLAMP	ALUMINUM
F10F02A	FRAME	ALUMINUM
F10F02B	FRAME	ALUMINUM
F10F02C	FRAME	ALUMINUM
F10F02D	FRAME	ALUMINUM
F10F02E	FRAME	ALUMINUM
F10F02F	FRAME	ALUMINUM
F10F02G	FRAME	ALUMINUM
F10F02H	FRAME	ALUMINUM
F10F02I	FRAME	ALUMINUM
F10F02J	FRAME	ALUMINUM
F10F02K	FRAME	ALUMINUM
F10F02L	FRAME	ALUMINUM
F10F02M	FRAME	ALUMINUM
F10F02N	FRAME	ALUMINUM
F10F02O	FRAME	ALUMINUM
F10F02P	FRAME	ALUMINUM
F10F02Q	FRAME	ALUMINUM
F10F02R	FRAME	ALUMINUM
F10F02S	FRAME	ALUMINUM
F10F02Z	FRAME	ALUMINUM
F10F03A	FRAME	ALUMINUM

F10F03B	FRAME	ALUMINUM
F10F03C	FRAME	ALUMINUM
F10F03D	FRAME	ALUMINUM
F10F03E	FRAME	ALUMINUM
F10F03F	FRAME	ALUMINUM
F10F03G	FRAME	ALUMINUM
F10S08A	BOLT	STEEL
F11C02	CLAMP	ALUMINUM
F11C04	CLAMP	ALUMINUM
F11C06	CLAMP	ALUMINUM
F11C07	CLAMP	ALUMINUM
F11F02A	FRAME	ALUMINUM
F11F02B	FRAME	ALUMINUM
F11F02C	FRAME	ALUMINUM
F11F02D	FRAME	ALUMINUM
F11F02E	FRAME	ALUMINUM
F11F02F	FRAME	ALUMINUM
F11F02G	FRAME	ALUMINUM
F11F02H	FRAME	ALUMINUM
F11F02I	FRAME	ALUMINUM
F11F02J	FRAME	ALUMINUM
F11F02K	FRAME	ALUMINUM
F11F02L	FRAME	ALUMINUM
F11F02M	FRAME	ALUMINUM
F11F02N	FRAME	ALUMINUM
F11F02O	FRAME	ALUMINUM
F11F02P	FRAME	ALUMINUM
F11F02Q	FRAME	ALUMINUM
F11F02R	FRAME	ALUMINUM
F11F02S	FRAME	ALUMINUM
F11F02Z	FRAME	ALUMINUM
F11F03A	FRAME	ALUMINUM
F11F03B	FRAME	ALUMINUM
F11F03C	FRAME	ALUMINUM
F12C02	CLAMP	ALUMINUM
F12C04	CLAMP	ALUMINUM
F12C05	CLAMP	ALUMINUM
F12C07	CLAMP	ALUMINUM
F12F02A	FRAME	ALUMINUM
F12F02B	FRAME	ALUMINUM
F12F02C	FRAME	ALUMINUM
F12F02D	FRAME	ALUMINUM
F12F02E	FRAME	ALUMINUM
F12F02F	FRAME	ALUMINUM
F12F02G	FRAME	ALUMINUM
F12H01	SHIM	ALUMINUM
F12S07B	BOLT	STEEL
G02C02	CLAMP	ALUMINUM
G02C06	CLAMP	ALUMINUM
G02C07	CLAMP	ALUMINUM
G02C10	CLAMP	ALUMINUM

G02C11	CLAMP	ALUMINUM
G03S01	BOLT	STEEL
G04C04	CLAMP	ALUMINUM
G04C06	CLAMP	ALUMINUM
G04C07	CLAMP	ALUMINUM
G04C09	CLAMP	ALUMINUM
G04C12	CLAMP	ALUMINUM
G06C06	CLAMP	ALUMINUM
G06C07	CLAMP	ALUMINUM
G06C09	CLAMP	ALUMINUM
G06C11	CLAMP	ALUMINUM
G06C12	CLAMP	ALUMINUM
G06S04A	BOLT	STEEL
G08C03	CLAMP	ALUMINUM
G08C04	CLAMP	ALUMINUM
G08C10	CLAMP	ALUMINUM
G08C11	CLAMP	ALUMINUM
G08C12	CLAMP	ALUMINUM
G10C01	CLAMP	ALUMINUM
G10C04	CLAMP	ALUMINUM
G10C06	CLAMP	ALUMINUM
G10C08	CLAMP	ALUMINUM
G10C10	CLAMP	ALUMINUM
G10C12	CLAMP	ALUMINUM
G10E01	EXPERIMENT TRAY	MOS DETECTOR
G10E02	EXPERIMENT TRAY	MOS DETECTOR
G12C07	CLAMP	ALUMINUM
G12C09	CLAMP	ALUMINUM
G12C10	CLAMP	ALUMINUM
G12C11	CLAMP	ALUMINUM
G12C12	CLAMP	ALUMINUM
G13R01	REFLECTOR	ALUMINUM
G13S01K	BOLT	STEEL
G13S01L	BOLT	STEEL
G13S02O	BOLT	STEEL
G14S01O	BOLT	STEEL
G15R01	REFLECTOR	ALUMINUM
G15S01E	BOLT	STEEL
G16R01	REFLECTOR	ALUMINUM
G17R01	REFLECTOR	ALUMINUM
G19R01	REFLECTOR	ALUMINUM
G20S01F	BOLT	STEEL
G21R01	REFLECTOR	ALUMINUM
G21S01I	BOLT	STEEL
G22R01	REFLECTOR	ALUMINUM
G23R01	REFLECTOR	ALUMINUM
H01C05	CLAMP	ALUMINUM
H01C08	CLAMP	ALUMINUM
H01C09	CLAMP	ALUMINUM
H01C10	CLAMP	ALUMINUM
H01C12	CLAMP	ALUMINUM

H01H02	SHIM	ALUMINUM
H01S03C	BOLT	STEEL
H03C04	CLAMP	ALUMINUM
H03C06	CLAMP	ALUMINUM
H03C08	CLAMP	ALUMINUM
H03C09	CLAMP	ALUMINUM
H03E00A	EXPERIMENT TRAY	LEXAN SHEET
H03E00B	EXPERIMENT TRAY	LEXAN SHEET
H03R01	REFLECTOR	ALUMINUM
H05C03	CLAMP	ALUMINUM
H05C06	CLAMP	ALUMINUM
H05C11	CLAMP	ALUMINUM
H05C12	CLAMP	ALUMINUM
H05S02B	BOLT	STEEL
H05S06C	BOLT	STEEL
H06C01	CLAMP	ALUMINUM
H06C03	CLAMP	ALUMINUM
H06C08	CLAMP	ALUMINUM
H06C10	CLAMP	ALUMINUM
H06C12	CLAMP	ALUMINUM
H06F01	FRAME	AL FRAME
H06F03	FRAME	AL FRAME
H06S02C	BOLT	STEEL
H06S04A	BOLT	STEEL
H07C01	CLAMP	ALUMINUM
H07C04	CLAMP	ALUMINUM
H07C05	CLAMP	ALUMINUM
H07C08	CLAMP	ALUMINUM
H07C10	CLAMP	ALUMINUM
H07C12	CLAMP	ALUMINUM
H09C07	CLAMP	ALUMINUM
H09C09	CLAMP	ALUMINUM
H09F03	FRAME	AL FRAME
H09R01	REFLECTOR	ALUMINUM
H09S02B	BOLT	STEEL
H11C02	CLAMP	ALUMINUM
H11C03	CLAMP	ALUMINUM
H11C05	CLAMP	ALUMINUM
H11C06	CLAMP	ALUMINUM
H11C12	CLAMP	ALUMINUM
H11E01	EXPERIMENT TRAY	MOS DETECTOR
H11H12	SHIM	ALUMINUM
H11S01C	BOLT	STEEL
H11S02B	BOLT	STEEL
H12C04	CLAMP	ALUMINUM
H12C09	CLAMP	ALUMINUM
H12C10	CLAMP	ALUMINUM
H12C11	CLAMP	ALUMINUM
H12C12	CLAMP	ALUMINUM
H12E00A	EXPERIMENT TRAY	LEXAN SHEET
H12E02	EXPERIMENT TRAY	MULTI BLANK

H12E03	EXPERIMENT TRAY	MULTI-BLANK
H12E05	EXPERIMENT TRAY	MULTI BLANK
H12S01	BOLT	STEEL
H13R01	REFLECTOR	ALUMINUM
H14E00A	EXPERIMENT TRAY	ALUMINUM
H14E00B	EXPERIMENT TRAY	ALUMINUM
H15E00A	EXPERIMENT TRAY	ALUMINUM
H15E00B	EXPERIMENT TRAY	ALUMINUM
H15R01	REFLECTOR	ALUMINUM
H15S01J	BOLT	STEEL
H17E00A	EXPERIMENT TRAY	ALUMINUM
H17E00B	EXPERIMENT TRAY	ALUMINUM
H17R01	REFLECTOR	ALUMINUM
H18E00A	EXPERIMENT TRAY	ALUMINUM
H18E00B	EXPERIMENT TRAY	ALUMINUM
H19R01	REFLECTOR	ALUMINUM
H20E00A	EXPERIMENT TRAY	ALUMINUM
H20E00B	EXPERIMENT TRAY	ALUMINUM
H21E00A	EXPERIMENT TRAY	ALUMINUM
H21E00B	EXPERIMENT TRAY	ALUMINUM
H21R01	REFLECTOR	ALUMINUM
H23E00A	EXPERIMENT TRAY	ALUMINUM
H23E00B	EXPERIMENT TRAY	ALUMINUM
H23R01	REFLECTOR	ALUMINUM
H24E00A	EXPERIMENT TRAY	ALUMINUM
H24E00B	EXPERIMENT TRAY	ALUMINUM
